ELEMENTARY SCHOOL MATHEMATICS

BOOK 3

SECOND EDITION

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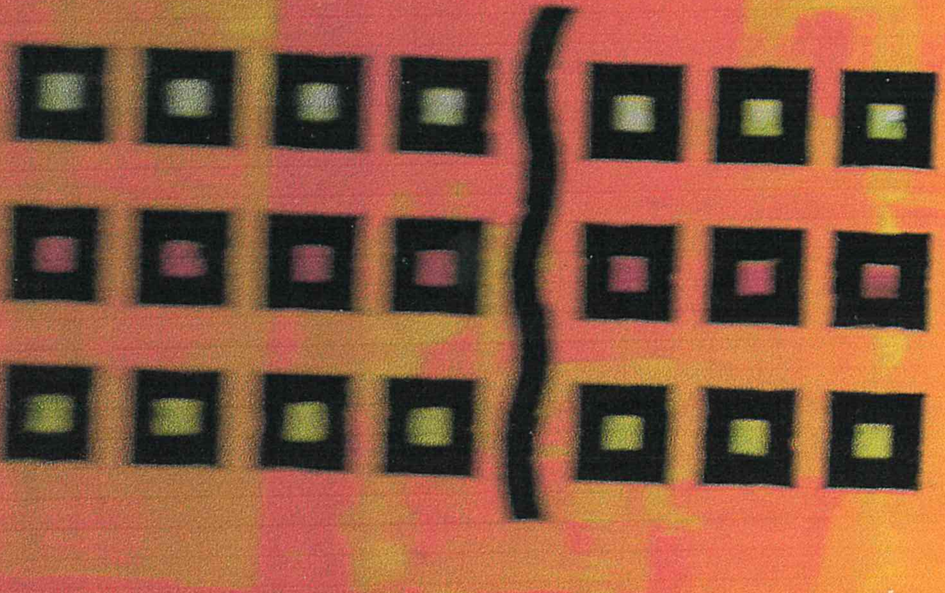

BOOK 3

ELEMENTARY SCHOOL MATHEMATICS

SECOND EDITION

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ADDISON-WESLEY PUBLISHING COMPANY
Menlo Park, California • Reading, Massachusetts • London • Don Mills, Ontario

Book 3

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CHAPTER 1 Place value

Sets, numbers, and numerals

- We look at a **set of objects.**
- We think about a **number.**
- We write a **numeral** for the number.

Study these examples:

Ⓐ The number of the set {★★★} is three.

We write: n{★★★} = 3.

Ⓑ The number of the set {a, b, c, d} is four.

We write: n{a, b, c, d} = 4.

EXERCISES

1. Write the numeral for each ||||||.

[A] n{▲▲▲} = ||||||
[B] n{■■■■■} = ||||||
[C] n{●●●●●●●} = ||||||
[D] n{★ ★} = ||||||
[E] n{●●●●●●} = ||||||
[F] n{××××××××} = ||||||
[G] n{▲▲} = ||||||
[H] n{■} = ||||||
[I] n{●●●●●●●●●} = ||||||
[J] n{ } = ||||||
[K] n{★★★★} = ||||||
[L] n{●●●●●●●●●●●} = ||||||

2. Write the word name for the number of each set in exercise 1.

3. Give the number for:

[A] the set of wheels on a new wagon.
[B] the set of letters in the word TEACHER.
[C] the set of blue tigers in your classroom.

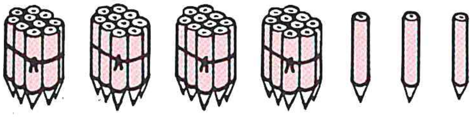
Grouping by tens

Using place value, we can write the numeral for any whole number with only the digits

0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

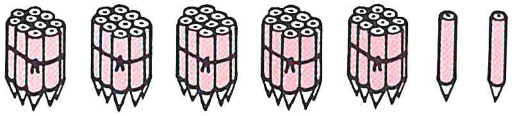
Here are some examples to help you think about grouping by tens in our place-value system.

A



4 tens and 3
We write 43.

B

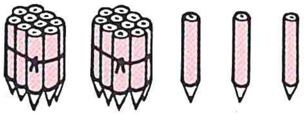


5 tens and 2
We write 52.

EXERCISES

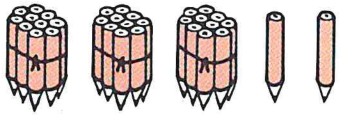
1. Write the numeral for each set of pencils.

[A]



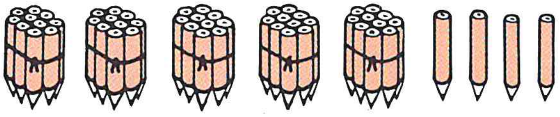
2 tens and 3
We write ||||||.

[B]



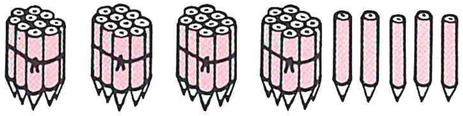
3 tens and 2
We write ||||||.

[C]



5 tens and 4
We write ||||||.

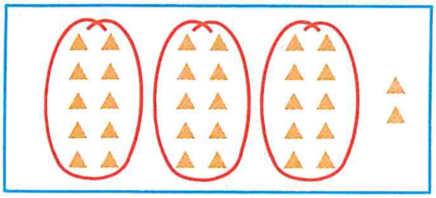
[D]



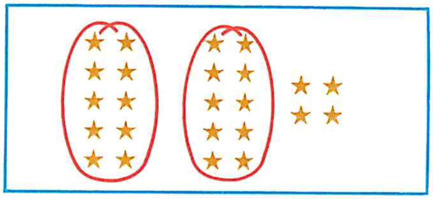
4 tens and 5
We write ||||||.

2. In the pictures below there are 10 objects in each ring.
Give the number of objects in each box.

[A]



[B]



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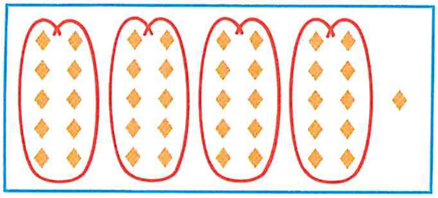
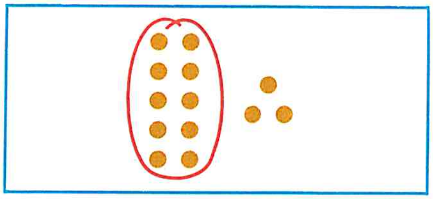
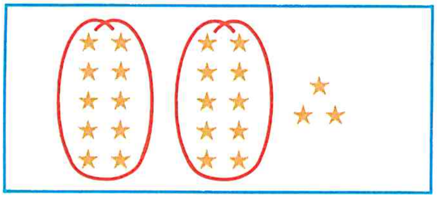


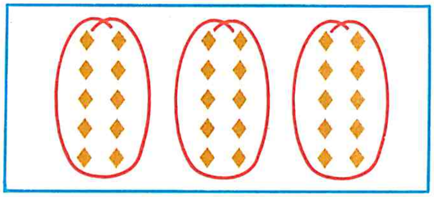
[D]



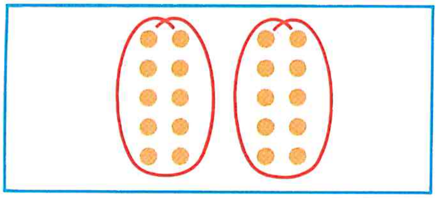
[E]



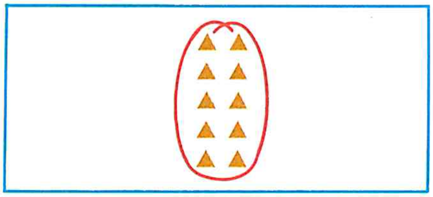
[F]



[G]



[H]



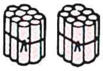
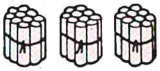
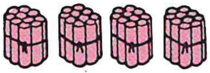
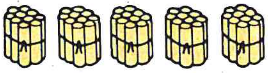
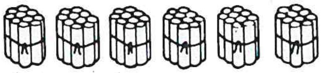
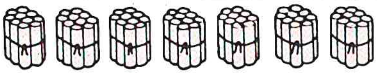
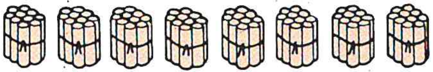
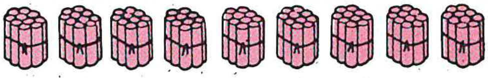
3. Write the 2-digit numeral for each of these.

[A] 2 tens and 3
[B] 4 tens and 2
[C] 1 ten and 5
[D] 3 tens and 4
[E] 6 tens and 7
[F] 9 tens and 3
[G] 5 tens and 7
[H] 7 tens and 5
[I] 6 tens and 0
[J] 1 ten and 1
[K] 1 ten and 0
[L] 2 tens and 0

4. Give the correct digit for each ▥.

[A] 37 means 3 tens and ▥.
[B] 48 means ▥ tens and 8.
[C] 82 means 8 tens and ▥.
[D] 50 means ▥ tens and 0.
[E] 93 means ▥ tens and 3.
[F] 39 means 3 tens and ▥.
[G] 15 means ▥ tens and 5.
[H] 10 means 1 ten and ▥.
[I] 67 means 6 tens and ▥.
[J] 76 means ▥ tens and 6.

2-digit numerals and counting

We see	We think	We write	We say
	2 tens	20	twenty
	3 tens	30	thirty
	4 tens	40	forty
	5 tens	50	fifty
	6 tens	60	sixty
	7 tens	70	seventy
	8 tens	80	eighty
	9 tens	90	ninety

EXERCISES

1. Read the number. Then tell how many tens and how many ones.

[A] 63
[B] 47
[C] 39
[D] 57
[E] 21
[F] 16
[G] 96
[H] 85
[I] 43
[J] 60
[K] 51
[L] 30
[M] 17
[N] 42
[O] 78
[P] 11
[Q] 10
[R] 99
[S] 48
[T] 80
[U] 27
[V] 35
[W] 35
[X] 70

2. Write the 2-digit numeral for each of these.

[A] 6 tens and 5
[B] 5 tens and 9
[C] 4 tens and 2
[D] 5 tens and 4
[E] 8 tens and 3
[F] 3 tens and 0
[G] 4 tens and 3
[H] 1 ten and 0
[I] 7 tens and 0
[J] 4 tens and 9
[K] 8 tens and 5
[L] 7 tens and 3

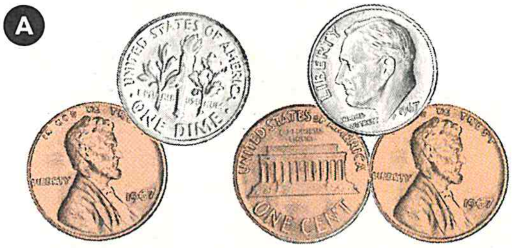
3. Write the correct numeral for each of these.

[A] fifty-six
[B] seventy-four
[C] twenty-nine
[D] sixty-eight
[E] forty-two
[F] ninety-seven
[G] seventeen
[H] thirty-five

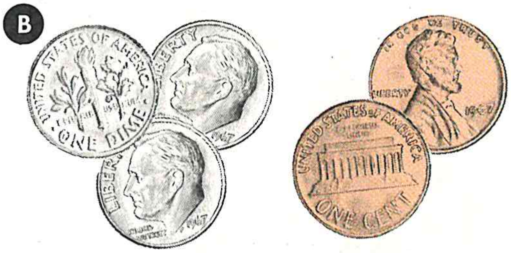
EXERCISES

1. Find the value of each collection.

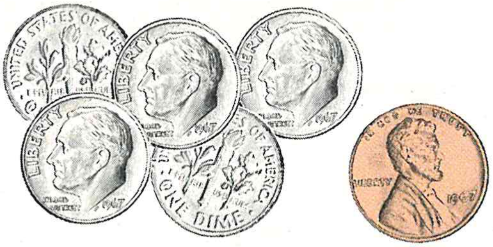
A



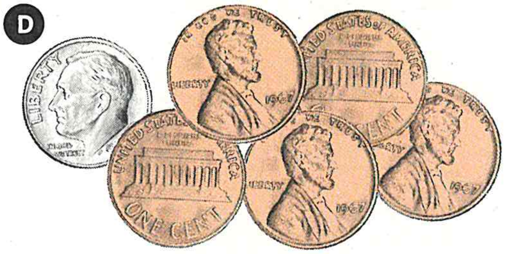
B



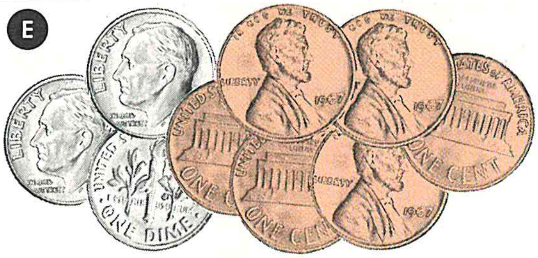
C



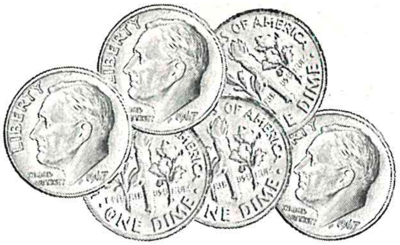
D



E



F



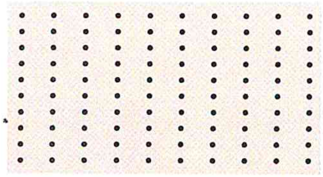
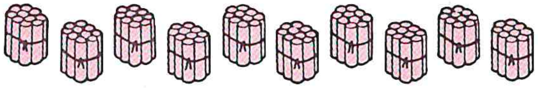
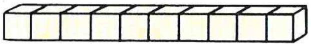
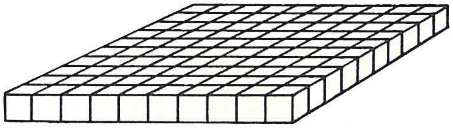
2. Copy each row, giving the missing numbers.

[A] 4, 5, 6, 7, ▥, ▥, ▥, ▥, 12, 13
[B] 24, 25, 26, 27, ▥, ▥, ▥, ▥, 32, 33
[C] 52, 53, 54, 55, 56, 57, ▥, ▥, ▥, ▥
[D] 90, 91, ▥, ▥, ▥, ▥, 96, 97, 98, 99
[E] 72, 73, 74, ▥, ▥, ▥, ▥, 79, 80, 81
[F] ▥, ▥, ▥, ▥, 48, 49, 50, 51, 52, 53
[G] 38, ▥, ▥, ▥, ▥, 43, 44, 45, 46, 47
[H] ▥, ▥, ▥, ▥, 62, 63, 64, 65, 66, 67
[I] ▥, ▥, ▥, ▥, 4, 5, 6, 7, 8, 9
[J] ▥, ▥, ▥, ▥, 22, 23, 24, 25, 26, 27

Think

1. Using the digits
1, 2, 7, 9,
how many 2-digit numerals can you write?
2. Which of these numerals names the largest number?
3. Which names the smallest?

Hundreds

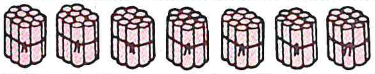
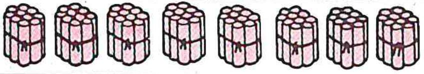
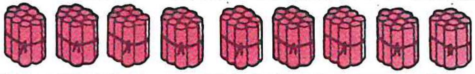
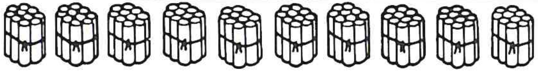
Ten		10 tens
	one hundred	
	one hundred	
	one hundred	

DISCUSSION EXERCISES

1. Explain how to count one hundred pencils without counting higher than ten.
2. How would you draw one hundred dots without counting higher than ten?
3. Can you draw one hundred twenty-three dots without counting higher than ten? Explain.

EXERCISES

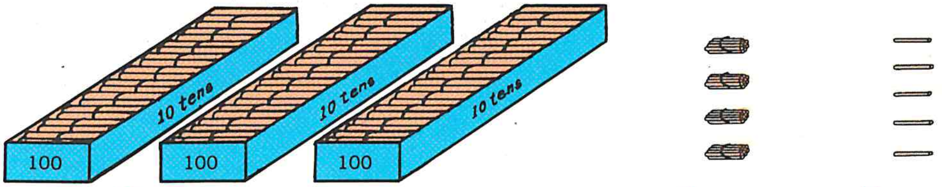
1. Give the missing numerals in the table.

We see	We think	We write
	7 tens	70
	8 tens	[A]
	9 tens	[B]
	10 tens	[C]

2. Give the missing numerals.

[A] For 9 tens and 7, we write ▥.
[B] For 9 tens and 8, we write ▥.
[C] For 9 tens and 9, we write ▥.
[D] For 10 tens and 0, we write ▥.

3-digit numerals



3 hundreds 4 tens 5 ones

We write 345.

DISCUSSION EXERCISES

Read the number. Then tell how many hundreds, tens, and ones.

1. 278
2. 346
3. 512
4. 923
5. 765
6. 492
7. 318
8. 640
9. 380
10. 704
11. 900
12. 506
13. 707
14. 770
15. 437
16. 864
17. 297
18. 485

EXERCISES

1. Write the numeral. (*h* stands for hundreds and *t* for tens.)

[A] 3 *h*, 2 *t*, and 6
[B] 4 *h*, 7 *t*, and 2
[C] 6 *h*, 5 *t*, and 0
[D] 6 *h*, 0 *t*, and 1
[E] 3 *h*, 2 *t*, and 0
[F] 3 *h*, 0 *t*, and 0
[G] 6 *h*, 2 *t*, and 7
[H] 1 *h*, 0 *t*, and 0
[I] 7 *h*, 6 *t*, and 5

2. Give the missing digit.

[A] 384 means 3 hundreds, ▨ tens, and 4 ones.
[B] 659 means ▨ hundreds, 5 tens, and 9 ones.
[C] 518 means 5 hundreds, 1 ten, and ▨ ones.
[D] 304 means ▨ hundreds, 0 tens, and 4 ones.
[E] 760 means 7 hundreds, 6 tens, and ▨ ones.
[F] 927 means 9 hundreds, ▨ tens, and 7 ones.

3. Write the numeral for each part.

[A] two hundred eighty-three
[B] five hundred sixty-seven
[C] nine hundred forty-one
[D] six hundred fifty-four
[E] three hundred thirty-nine
[F] seven hundred twenty-eight

Think

1. Using the digits
3, 5, 7,
how many 3-digit numerals can you write?
2. Which one names the largest number?
3. Which names the smallest?

Counting

1. Find the number that is 1 more than

[A] 9
[B] 19
[C] 29
[D] 49
[E] 69
[F] 79
[G] 89
[H] 99
[I] 109
[J] 119
[K] 139
[L] 439
[M] 199
[N] 699
[O] 899

2. Copy each column and complete the counting.

[A]	[B]	[C]	[D]	[E]
5	15	65	365	765
6	16	66	366	766
7	17	67	367	767
8		68	368	768
9				
10				
	21			
	22			

[F]	[G]	[H]	[I]	[J]
96	196	596	796	896
97	197	597	797	897
98	198		798	
99			799	
		601		
102		602		902
103	203	603		903

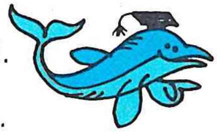
3. Find the number that is

[A] 10 more than 90
[B] 10 more than 390
[C] 10 more than 990
[D] 1 more than 99
[E] 1 more than 899
[F] 1 more than 999
[G] 100 more than 800
[H] 100 more than 900

Think

Find the number that is 1 less than

1. one hundred.
2. one thousand.
3. ten tens.
4. ten hundreds.
5. one hundred hundreds.

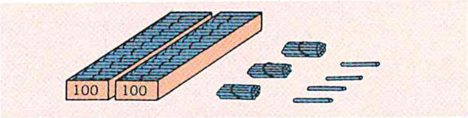


Hundreds and thousands

EXERCISES

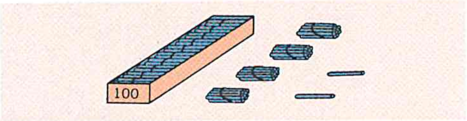
1. Give the number of hundreds, tens, and ones for each set.
There are 10 in each bundle and 100 in each box.

[A]



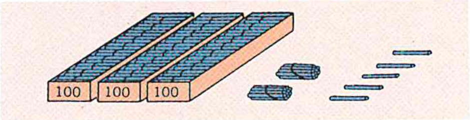
▥ hundreds, ▥ tens, and ▥ ones

[B]



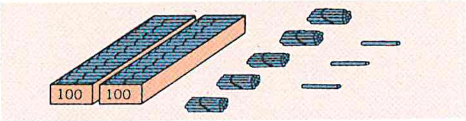
▥ hundreds, ▥ tens, and ▥ ones

[C]



▥ hundreds, ▥ tens, and ▥ ones

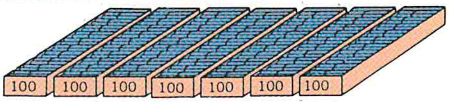
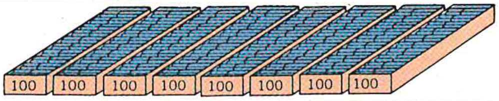
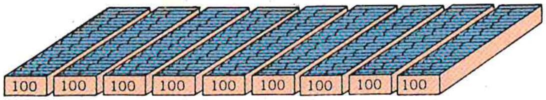
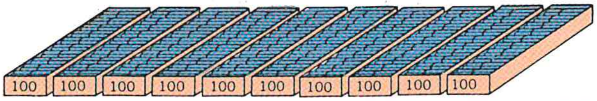
[D]



▥ hundreds, ▥ tens, and ▥ ones

2. Give the number for each set in exercise 1.

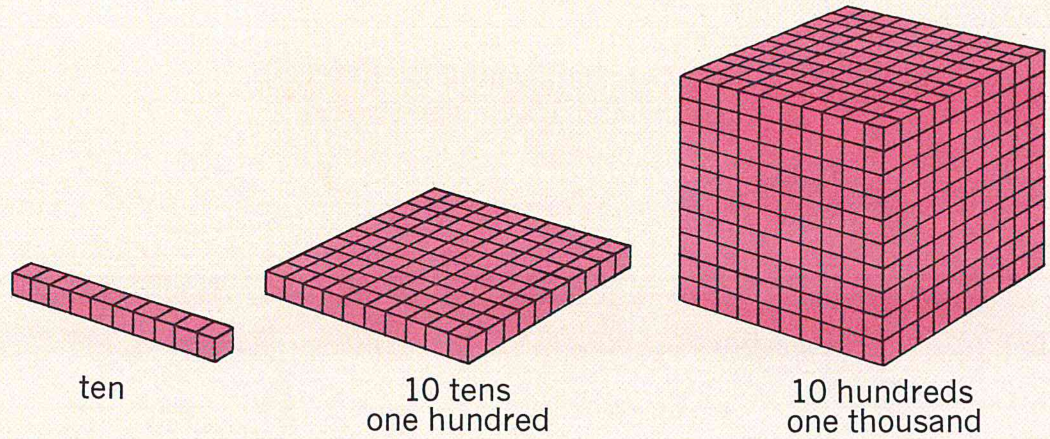
3. Give the missing numerals in the table.

We see	We think	We write
	7 hundreds	700
	8 hundreds	[A]
	9 hundreds	[B]
	10 hundreds	[C]

4. Write the correct numerals.

[A] For 4 hundreds, 8 tens, and 3, we write ▥.
[B] For 4 hundreds, 9 tens, and 7, we write ▥.
[C] For 9 hundreds, 9 tens, and 7, we write ▥.
[D] For 9 hundreds, 9 tens, and 8, we write ▥.
[E] For 9 hundreds, 9 tens, and 9, we write ▥.
[F] For 10 hundreds, 0 tens, and 0, we write ▥.

Thousands



DISCUSSION EXERCISES

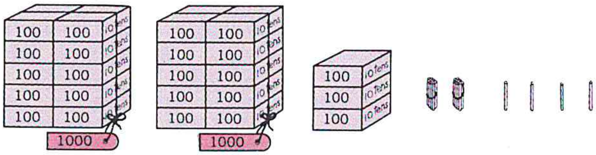
Read the number. Then tell how many thousands, hundreds, tens, and ones.

1. 7264
2. 8315
3. 9126
4. 8427
5. 1635
6. 7986
7. 8204
8. 3716
9. 9025
10. 8840
11. 7602
12. 9100
13. 8340
14. 2600
15. 5000
16. 8083
17. 9216
18. 7007
19. 6000
20. 5080
21. 3210
22. 1000
23. 9020
24. 8003

EXERCISES

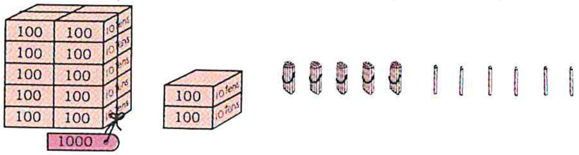
1. Give the 4-digit numeral for each set.

[A]



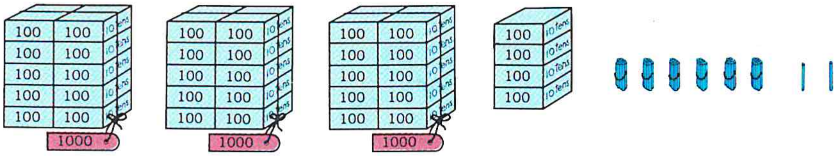
For 2 thousands, 3 hundreds, 2 tens, and 4 ones, we write ▯.

[B]



For 1 thousand, 2 hundreds, 5 tens, and 6 ones, we write ▯.

[C]



For 3 thousands, 4 hundreds, 6 tens, and 2 ones, we write ▯.

Place-value exercises

1. Write the 4-digit numeral for each of these. (*th* stands for thousands, *h* stands for hundreds, and *t* stands for tens.)

[A] 6 *th*, 5 *h*, 2 *t*, and 4
[B] 1 *th*, 2 *h*, 3 *t*, and 9
[C] 9 *th*, 4 *h*, 2 *t*, and 1
[D] 9 *th*, 4 *h*, 2 *t*, and 0
[E] 9 *th*, 4 *h*, 0 *t*, and 0
[F] 9 *th*, 0 *h*, 0 *t*, and 0
[G] 1 *th*, 1 *h*, 1 *t*, and 1
[H] 1 *th*, 0 *h*, 0 *t*, and 0
[I] 6 *th*, 0 *h*, 8 *t*, and 0
[J] 4 *th*, 5 *h*, 0 *t*, and 2
[K] 7 *th*, 3 *h*, 5 *t*, and 6
[L] 3 *th*, 2 *h*, 0 *t*, and 0

2. The numerals 6325 and 6425 differ only in the hundreds place. Which number, 6325 or 6425, has more hundreds?

3. Give the number that has one more ten than

[A] 25 [B] 468 [C] 841 [D] 3168 [E] 575 [F] 9256

4. Give the number that has one more hundred than

[A] 256 [B] 682 [C] 4682 [D] 7256 [E] 8417 [F] 1425

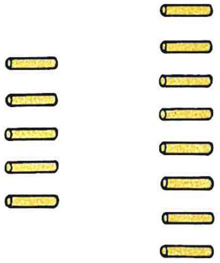
5. In each numeral below, one of the digits is red. Give the number for which that digit stands. For example, in exercise A the 7 stands for 700.

[A] 6728
[B] 4325
[C] 4286
[D] 9515
[E] 7106
[F] 8732
[G] 9457
[H] 1260
[I] 4037
[J] 5208

6. Find the missing digit for each of these.

[A] 6721 means ▥ hundreds, 6 thousands, 1 one, 2 tens.
[B] 4362 means 4 thousands, ▥ tens, 3 hundreds, 2 ones.
[C] 7820 means 2 tens, 8 hundreds, 0 ones, ▥ thousands.
[D] 5207 means ▥ hundreds, 0 tens, 5 thousands, 7 ones.
[E] 6431 means 1 one, 6 thousands, ▥ tens, 4 hundreds.
[F] 2803 means 2 thousands, ▥ tens, 8 hundreds, 3 ones.
[G] 4076 means 7 tens, 0 hundreds, ▥ ones, 4 thousands.
[H] 8030 means 0 ones, ▥ thousands, 0 hundreds, 3 tens.

Inequalities

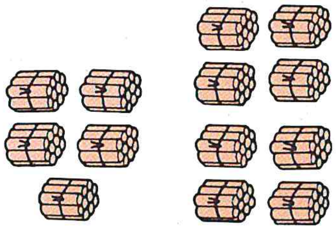


5 is less than 8.

$5 < 8$

8 is greater than 5.

$8 > 5$

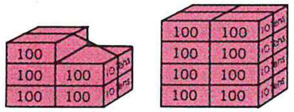


50 is less than 80.

$50 < 80$

80 is greater than 50.

$80 > 50$



500 is less than 800.

$500 < 800$

800 is greater than 500.

$800 > 500$

DISCUSSION EXERCISES

Explain an easy way to remember how to use the inequality marks (< and >). Then, for exercises 1–30, read the sentence and tell whether or not it is true.

1. $4 < 9$
2. $8 < 6$
3. $5 > 1$
4. $5 > 8$
5. $4 > 9$
6. $40 < 90$
7. $80 < 30$
8. $80 > 60$
9. $60 < 70$
10. $20 > 10$
11. $200 < 700$
12. $600 > 400$
13. $600 > 800$
14. $800 < 400$
15. $300 > 100$
16. $504 < 506$
17. $504 > 506$
18. $509 > 506$
19. $509 < 506$
20. $509 < 510$
21. $28 > 27$
22. $28 < 25$
23. $56 > 46$
24. $58 < 28$
25. $94 > 74$
26. $214 > 514$
27. $389 < 789$
28. $564 > 164$
29. $385 > 325$
30. $426 < 436$

EXERCISES

1. Which of the two numbers is greater?

[A] 9 or 7
[B] 5 or 8
[C] 6 or 2
[D] 80 or 20
[E] 10 or 50
[F] 60 or 40
[G] 900 or 300
[H] 400 or 700
[I] 600 or 500
[J] 2000 or 5000
[K] 6000 or 4000
[L] 8000 or 9000

2. Answer true or false for each exercise.

[A] 9 is greater than 7.
[B] 90 is greater than 70.
[C] 50 is greater than 80.
[D] 51 is greater than 50.
[E] 68 is greater than 64.
[F] 72 is greater than 73.
[G] 200 is less than 500.
[H] 300 is less than 200.
[I] 604 is less than 607.
[J] 820 is less than 850.
[K] 750 is less than 720.
[L] 930 is less than 940.

3. Which of the two numbers is greater?

[A] 8 or 3
[B] 6 or 9
[C] 5 or 8
[D] 82 or 32
[E] 67 or 97
[F] 35 or 38
[G] 68 or 63
[H] 625 or 925
[I] 655 or 685
[J] 628 or 623
[K] 6219 or 9219
[L] 4519 or 4819

4. Write each number pair on your paper. Then put the correct mark in place of the ◍. Write the two numbers in the order given.

[A] 2 ◍ 8
(Answer: 2 < 8)
[B] 6 ◍ 2
[C] 3 ◍ 7
[D] 80 ◍ 50
[E] 70 ◍ 90
[F] 72 ◍ 92
[G] 72 ◍ 71
[H] 72 ◍ 78
[I] 65 ◍ 55
[J] 34 ◍ 64
[K] 200 ◍ 500
[L] 230 ◍ 530
[M] 837 ◍ 537
[N] 462 ◍ 762
[O] 520 ◍ 580
[P] 740 ◍ 710
[Q] 684 ◍ 654
[R] 237 ◍ 239
[S] 6426 ◍ 5426
[T] 8237 ◍ 8537
[U] 6428 ◍ 6448

Think

1. Find the largest 4-digit number that uses no digit twice.
2. Find the smallest 4-digit number that uses no digit twice.
3. Find the largest 4-digit number that uses 2 digits twice each.

5- and 6-digit numerals

These digits tell how many thousands.

7,628 seven thousand, six hundred twenty-eight
36,584 thirty-six thousand, five hundred eighty-four
418,293 four hundred eighteen thousand, two hundred ninety-three

DISCUSSION EXERCISES

Read the number. Then tell how many thousands, hundreds, tens, and ones.

1. 8264
2. 19,348
3. 12,615
4. 9485
5. 24,652
6. 91,860
7. 58,403
8. 27,064
9. 152,634
10. 127,500
11. 140,372
12. 500,500
13. 672,483
14. 529,006
15. 318,864
16. 902,902
17. 587,418
18. 70,070
19. 601,485
20. 902,209
21. 333,333
22. 400,004
23. 101,010
24. 999,999

EXERCISES

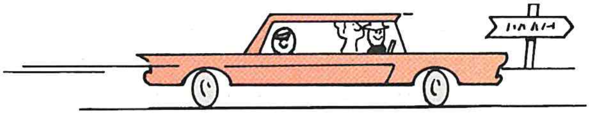
1. Give the number of thousands. For part A, write 6. For part B, write 27.

[A] 6287
[B] 27,287
[C] 394,287
[D] 9564
[E] 37,564
[F] 291,564
[G] 53,486
[H] 7486
[I] 875,486
[J] 326,439
[K] 52,475
[L] 18,627

2. Write the numeral for each exercise.

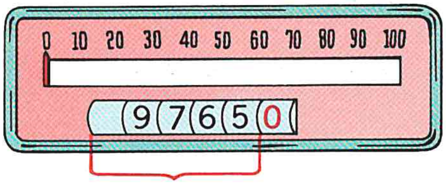
[A] seven thousand two hundred twenty-six
[B] fourteen thousand, five hundred eighty-three
[C] ninety-six thousand, four hundred thirty-eight
[D] one hundred twenty-six thousand, two hundred seventy-six
[E] three hundred eighty-six thousand, four hundred thirty
[F] nine hundred ninety-nine thousand, nine hundred ninety-nine

Vacation travel fun



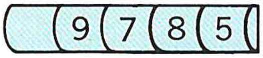
Jim liked to watch the speedometer on his father's car when he and his family were on vacation last summer. When they started the trip the speedometer looked like this:

The odometer counts miles traveled.

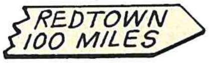


This part tells the number of miles.

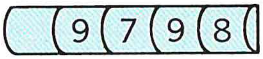
1. How far had Jim's family traveled when the odometer looked like this? →



2. Jim saw this sign.

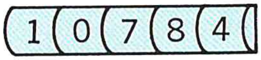


He looked at the odometer and saw this. →

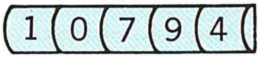


What did the odometer read when they were in Redtown?

3. At Wood City the odometer looked like this. →

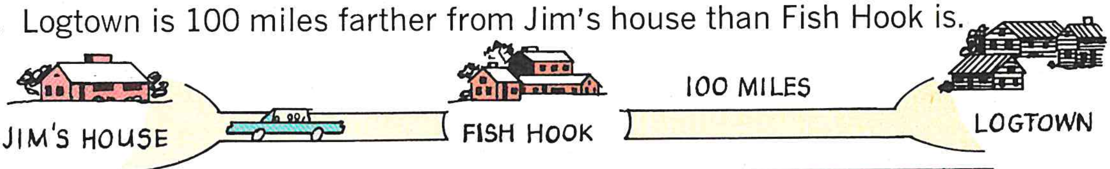


At River City the odometer looked like this. →

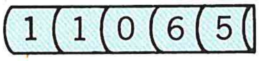


How far is it from Wood City to River City?

4. Logtown is 100 miles farther from Jim's house than Fish Hook is.

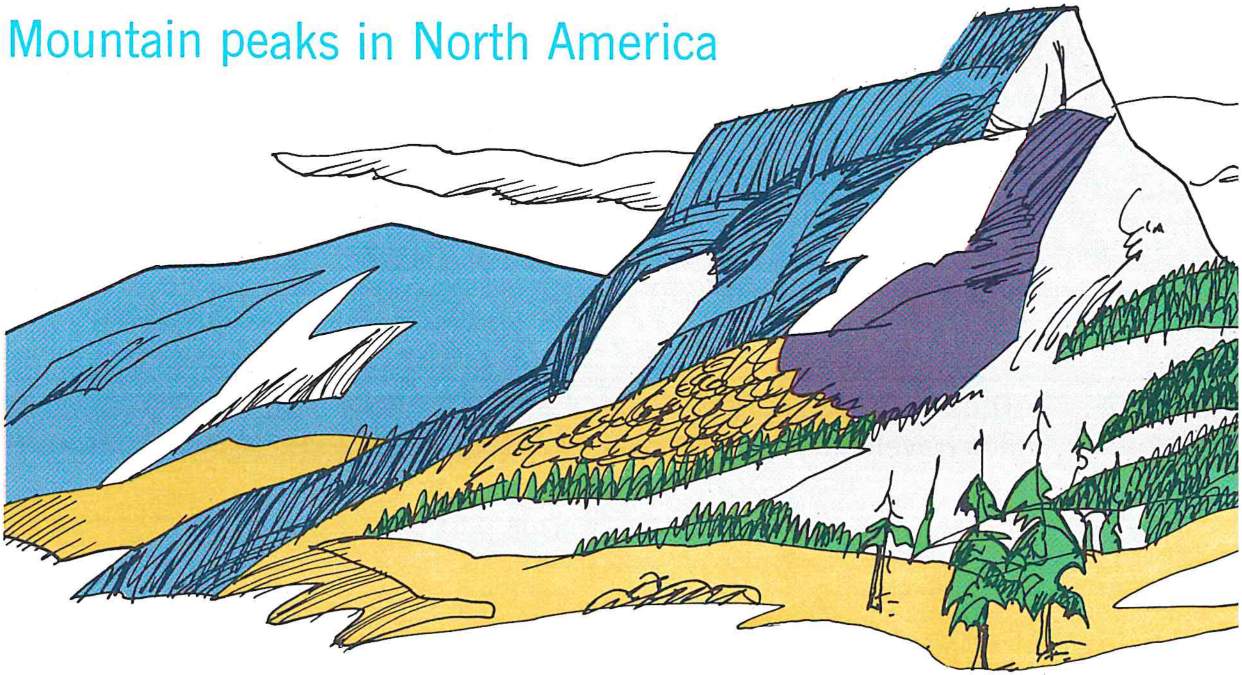


The odometer looked like this at Fish Hook. →



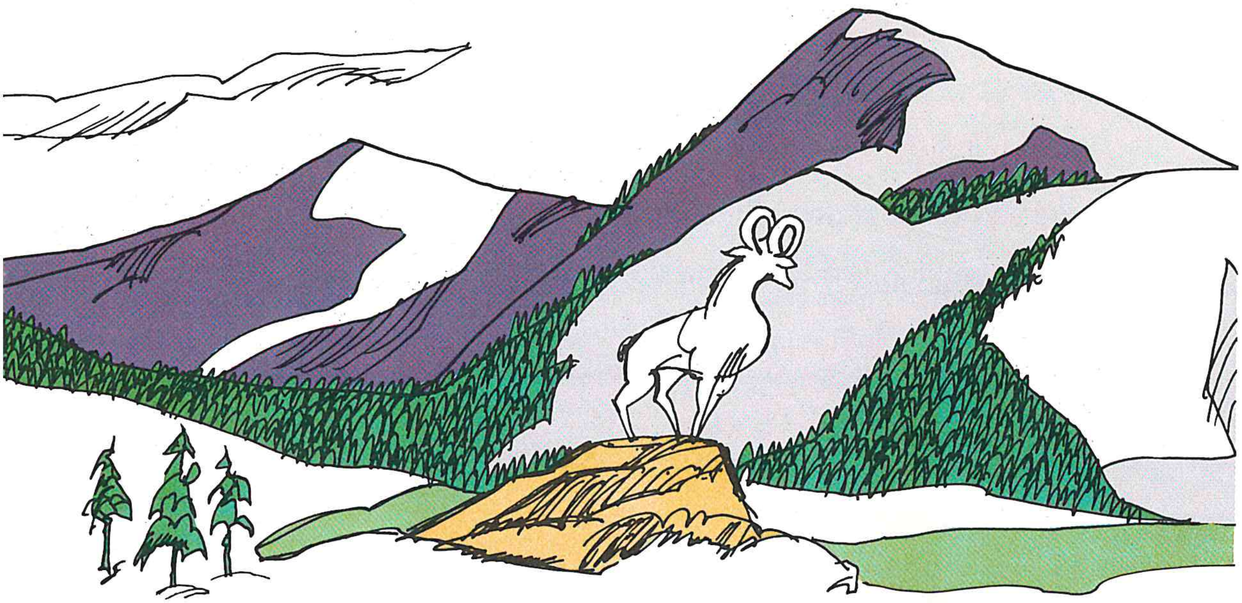
What do you think the odometer read at Logtown?

Mountain peaks in North America



The first two mountains in the table are the highest in North America. There are other mountain peaks in North America higher than the remaining mountains listed in the table, but none is as high as the first two.

Name	Place	Feet
McKinley	Alaska	20,320
Logan	Canada	19,850
Citlaltepetl	Mexico	18,700
King	Canada	17,130
Steele	Canada	16,440
Bona	Alaska	16,420
Wood	Canada	15,885
Bear	Alaska	14,850
Whitney	California	14,495
Elbert	Colorado	14,431
Rainier	Washington	14,410
Lincoln	Colorado	14,284



EXERCISES

1. What mountain peak in the table is more than 17,000 feet and less than 18,000 feet?

2. What mountain peak in the table is between 15,000 feet and 16,000 feet?

3. How many peaks in the table are less than 16,000 feet?

4. How many peaks in the table are more than 15,000 feet? How many are more than 14,000 feet?

5. If an airplane flies at 17,000 feet, over how many of these peaks could it fly?

6. Which mountain peaks are more than 14,400 feet and less than 14,500 feet?

7. How much higher is Mount Steele than Mount Bona?

8. How much higher is Mount Elbert than Mount Rainier?

9. Mount Hubbard (not given in the table) is 100 feet higher than Mount Bear. How high is Mount Hubbard?

10. How much higher is Mount Wood than Mount Bear?

★ One million

One million ⟶ 1,000,000

We can think of one million in different ways:

One million is a thousand thousand.

1,000,000

One million is ten hundred thousand.

1,000,000

EXERCISES

1. Give the next 3 numbers for each of these.

[A] 500
600
700
⋮

[B] 950
960
970
⋮

[C] 5000
6000
7000
⋮

[D] 9500
9600
9700
⋮

[E] 50,000
60,000
70,000
⋮

[F] 95,000
96,000
97,000
⋮

[G] 500,000
600,000
700,000
⋮

[H] 950,000
960,000
970,000
⋮

2. Write the numeral for each of these.

[A] nine hundred thousand
[B] ten hundred thousand
[C] nine hundred ninety-nine thousand
[D] one thousand thousand

3. [A] What number is 1 more than 99?
[B] What number is 1 more than 999?
[C] What number is 1 more than 9999?
[D] What number is 1 more than 99,999?
[E] What number is 1 more than 999,999?

Think

I think I'm big until
  I spy
So many numbers
  larger than I.
My name has a one
And zeros galore.
Seven digits in all,
  and not one more.

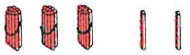
WHO AM I?

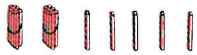
Chapter review

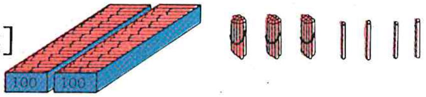
1. Give the number for each ▥.

[A] n{▲▲▲ ▲▲▲} = ▥ [B] n{□□□□ □□□□} = ▥ [C] n{□} = ▥ [D] n{ } = ▥

2. Give the number for each set of sticks.

[A]


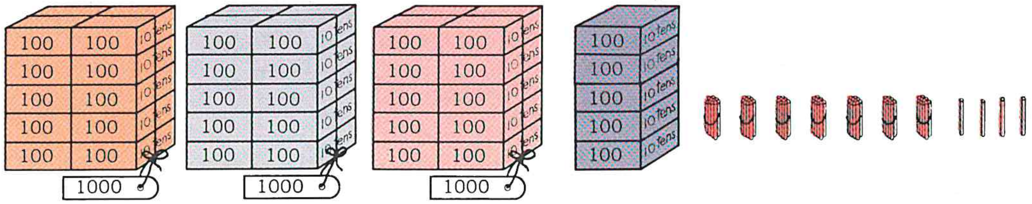
[B]


[C]


3. Write the numeral for each of these.

[A] 7 tens and 6
[B] 3 tens and 0
[C] 5 tens and 2
[D] 6 tens and 9
[E] 8 hundreds, 6 tens, and 5
[F] 7 hundreds, 1 ten, and 2
[G] 1 hundred, 0 tens, and 9
[H] 9 hundreds, 9 tens, and 9

4. How many sticks in this set?



5. Write the numeral for each of these.

[A] seventy-five
[B] forty-six
[C] two hundred eighty-seven
[D] four hundred ninety-three
[E] six thousand four hundred thirty-two
[F] twenty-three thousand, one hundred sixty-nine
[G] four hundred sixty-eight thousand, two hundred twenty-one

6. Give the next three numbers in each counting sequence.

[A] 16, 17, 18, . . .
[B] 55, 56, 57, . . .
[C] 96, 97, 98, . . .
[D] 127, 128, 129, . . .
[E] 397, 398, 399, . . .
[F] 996, 997, 998, . . .

7. Give the correct sign > or < for each ▥.

[A] 68 ▥ 78
[B] 43 ▥ 33
[C] 127 ▥ 327
[D] 546 ▥ 526
[E] 3285 ▥ 3286
[F] 9463 ▥ 9763

CHAPTER 2 Addition and subtraction

Addition and subtraction are related

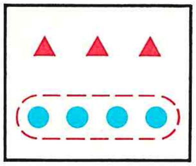
Sets help you understand addition and subtraction.

In the pictures below, when you see arrows, think about putting sets together. When you see objects in a dotted ring, think about removing them.

DISCUSSION EXERCISES

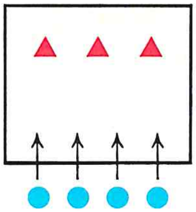
1. In each part, tell how the picture helps explain the equation.

[A]



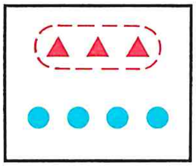
$7 - 4 = 3$

[B]



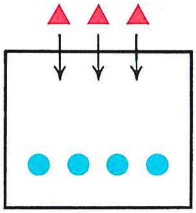
$3 + 4 = 7$

[C]



$7 - 3 = 4$

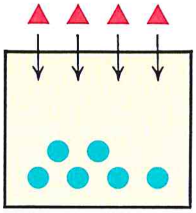
[D]



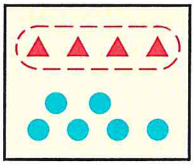
$4 + 3 = 7$

2. The numbers for this exercise are 6, 4, and 10. Write and explain an equation for each figure.

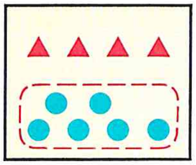
[A]



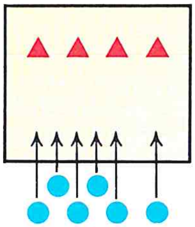
[B]



[C]



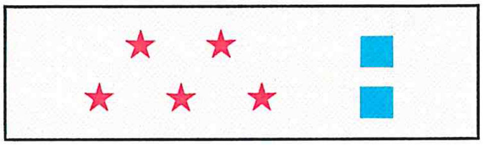
[D]



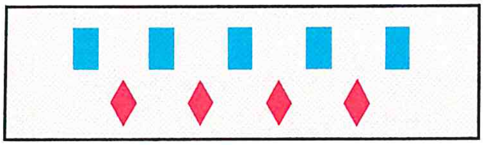
3. Explain how you can think about the set to help you solve the 4 equations.

[A] $5 + 2 = \boxed{n}$ [C] $7 - 2 = \boxed{n}$

[B] $2 + 5 = \boxed{n}$ [D] $7 - 5 = \boxed{n}$

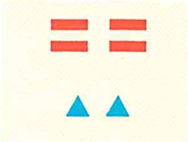


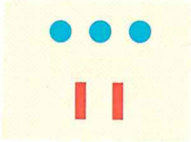
4. Write and explain 2 addition and 2 subtraction equations for this set. →



EXERCISES

1. Write 4 different equations for each set.

[A]


[B]


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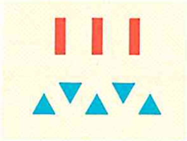
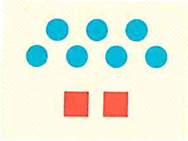
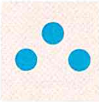
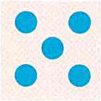
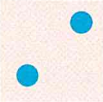


[D]


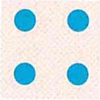
2. Answer the questions about the sets.

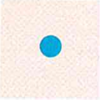
U


V


W


X

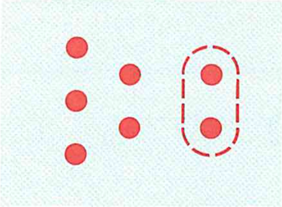
Y


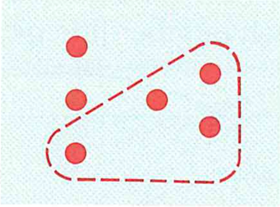
Z


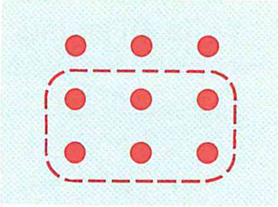
[A] How many dots in sets U and V together?
[B] How many dots in sets W and Y together?
[C] How many dots in sets V and Z together?
[D] How many dots in sets U and Y together?
[E] How many dots in sets W and X together?
[F] How many dots in sets V and X together?

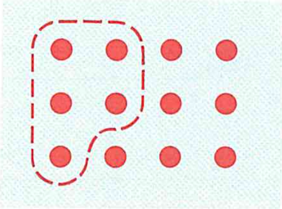
3. Write an addition equation for each part of exercise 2.

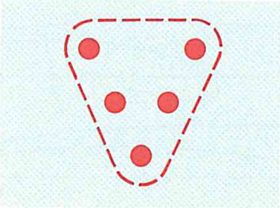
4. Think about removing the dots inside the dotted ring. Then write a subtraction equation for each set.

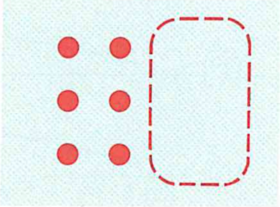
[A]


[B]


[C]


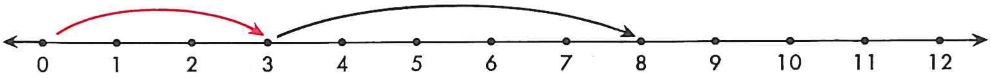
[D]


[E]


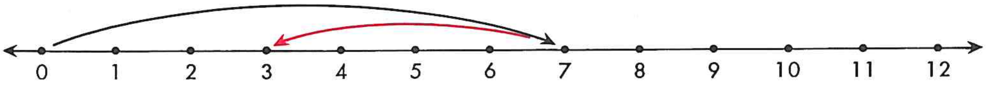
[F]


Addition and subtraction on the number line

The number line helps you think about addition and subtraction.



$3 + 5 = 8$

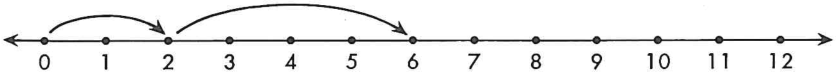


$7 - 4 = 3$

EXERCISES

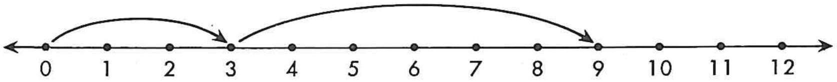
1. Give the missing number in the equation for each number line.

[A]



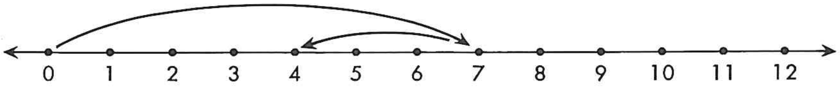
$2 + 4 = n$

[B]



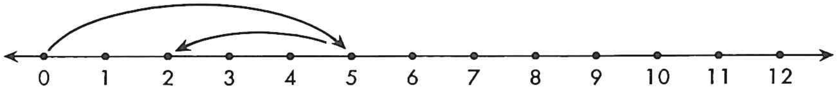
$3 + 6 = n$

[C]



$7 - 3 = n$

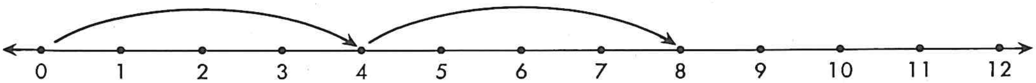
[D]



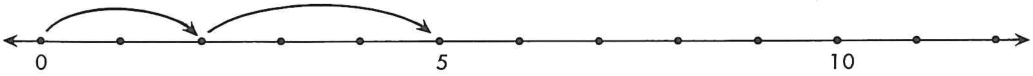
$5 - 3 = n$

2. Write an equation for each number-line picture.

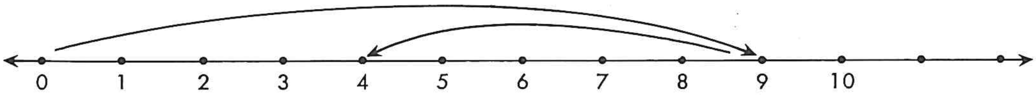
[A]



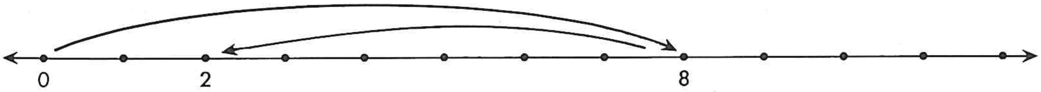
[B]



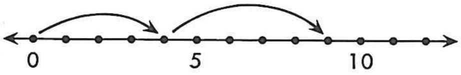
[C]

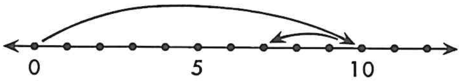


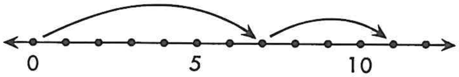
[D]

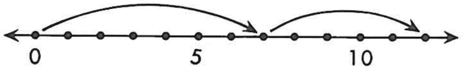


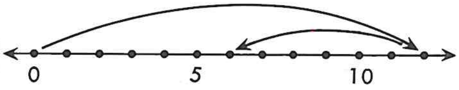
3. Write an equation for each number-line picture.

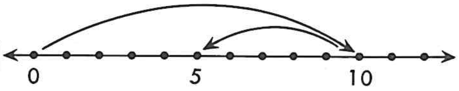
[A]


[B]


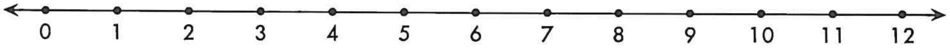
[C]


[D]


[E]


[F]


4. Draw a 6-inch line on your paper. Starting at the 0 dot, mark dots each half inch and label them as shown.



Now use arrows to show the sum 5 + 6.

5. Draw a number line for each part below. Show the sum or difference by using arrows.

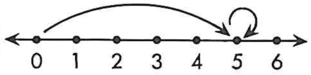
[A] 6 + 3	[C] 11 − 9	[E] 8 + 3	[G] 11 − 3
[B] 10 − 2	[D] 12 − 2	[F] 3 + 8	[H] 6 + 4

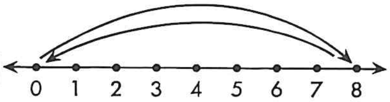
6. Write an equation for each part of exercise 5.

7. Draw a number line and show the sum 2 + 2 + 2 + 2 + 2 + 2.

8. Draw a number line and show the sum 3 + 3 + 3 + 3.

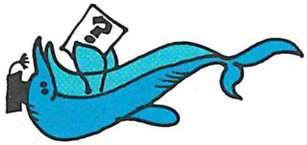
★ **9.** Write an equation for each number-line picture.

[A]


[B]


Think

There is no largest number.
The last one can't be found.
Just add me to get the next.
There is no upper bound.



WHO AM I?

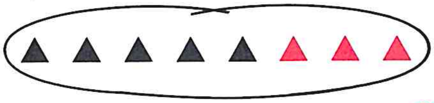
Addends and sums

The numbers we add are called **addends**. The answer is called the **sum**.

$$\underset{\text{addend}}{\underset{\uparrow}{4}} + \underset{\text{addend}}{\underset{\uparrow}{3}} = \underset{\text{sum}}{7} \qquad \begin{array}{rl} 2 & \leftarrow \text{addend} \\ +\ 6 & \leftarrow \text{addend} \\ \hline 8 & \leftarrow \text{sum} \end{array}$$

Here are 3 ways to think about finding sums.

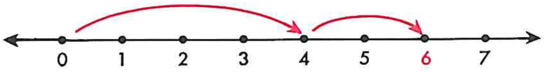
① You can put sets together to tell how many there are in all.



$$\underset{\text{addend}}{\underset{\uparrow}{5}} + \underset{\text{addend}}{\underset{\uparrow}{3}} = \underset{\text{sum}}{8}$$

When one addend is 5 and the other addend is 3, the sum is 8.

② You can use the number line or counting.



$$\underset{\text{addend}}{\underset{\uparrow}{4}} + \underset{\text{addend}}{\underset{\uparrow}{2}} = \underset{\text{sum}}{6}$$

③ You can use facts you already know.
Since $3 + 3 = 6$, you know that $3 + 4 = 7$.

EXERCISES

1. Find the sums.

[A] $\begin{array}{r}6\\+3\\\hline\end{array}$ [B] $\begin{array}{r}6\\+4\\\hline\end{array}$ [C] $\begin{array}{r}5\\+4\\\hline\end{array}$ [D] $\begin{array}{r}6\\+2\\\hline\end{array}$ [E] $\begin{array}{r}7\\+3\\\hline\end{array}$ [F] $\begin{array}{r}4\\+6\\\hline\end{array}$ [G] $\begin{array}{r}4\\+3\\\hline\end{array}$ [H] $\begin{array}{r}4\\+5\\\hline\end{array}$

[I] $\begin{array}{r}3\\+7\\\hline\end{array}$ [J] $\begin{array}{r}5\\+5\\\hline\end{array}$ [K] $\begin{array}{r}2\\+8\\\hline\end{array}$ [L] $\begin{array}{r}5\\+2\\\hline\end{array}$ [M] $\begin{array}{r}4\\+4\\\hline\end{array}$ [N] $\begin{array}{r}1\\+9\\\hline\end{array}$ [O] $\begin{array}{r}6\\+0\\\hline\end{array}$ [P] $\begin{array}{r}2\\+4\\\hline\end{array}$

2. Solve the equations.

[A] $5 + 4 = n$ [D] $5 + 5 = n$ [G] $6 + 2 = n$ [J] $6 + 3 = n$
[B] $3 + 7 = n$ [E] $4 + 6 = n$ [H] $8 + 2 = n$ [K] $3 + 5 = n$
[C] $2 + 6 = n$ [F] $2 + 7 = n$ [I] $3 + 4 = n$ [L] $4 + 4 = n$

3. What is the sum

[A] when 3 and 5 are addends?
[B] when 2 and 7 are addends?
[C] when 4 and 6 are addends?
[D] when 5 and 4 are addends?
[E] when 6 and 2 are addends?
[F] when 7 and 3 are addends?

4. Give the missing numbers in the addition tables.

	Add 2	
	5	7
	3	5
[A]	6	▥
[B]	4	▥

	Add 4	
	4	8
[C]	5	▥
[D]	3	▥
[E]	6	▥

	Add 3	
	7	10
[F]	5	▥
[G]	6	▥
[H]	4	▥

	Add 5	
[I]	2	▥
[J]	5	▥
[K]	3	▥
[L]	4	▥

5. Copy each addition table and give the missing numbers.

[A]

+	5	4
3	8	7
2	7	▥

[B]

+	4	6
4	8	▥
3	▥	▥

[C]

+	5	0
1	▥	▥
4	▥	▥

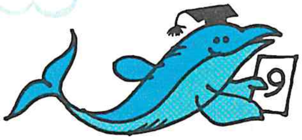
[D]

+	7	6
2	▥	▥
3	▥	▥

6. Give the missing numbers in the table.

	Addend	Addend	Sum
	3	2	5
[A]	5	3	▥
[B]	4	▥	6
[C]	7	▥	9
[D]	▥	3	5
[E]	3	▥	8
[F]	▥	4	10

Think



Find two numbers so that

- ▶ their sum is 9

and

- ▶ their difference is 9.

7. Solve the equations.

[A] $2 + \boxed{n} = 4$
[B] $3 + \boxed{n} = 7$
[C] $\boxed{n} + 5 = 6$
[D] $\boxed{n} + 8 = 10$
[E] $6 + \boxed{n} = 7$
[F] $6 + \boxed{n} = 10$
[G] $\boxed{n} + 4 = 8$
[H] $5 + \boxed{n} = 7$
[I] $\boxed{n} + 3 = 7$
[J] $4 + \boxed{n} = 4$
[K] $9 + \boxed{n} = 10$
[L] $\boxed{n} + 5 = 10$

Differences and missing addends

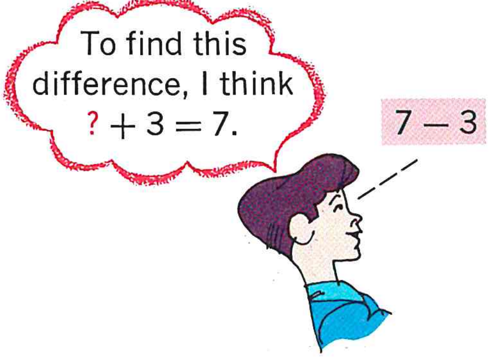
You can find differences by finding missing addends.

When you find this addend, → $\boxed{n} + 5 = 8$
you have found this difference. → $8 - 5 = \boxed{n}$

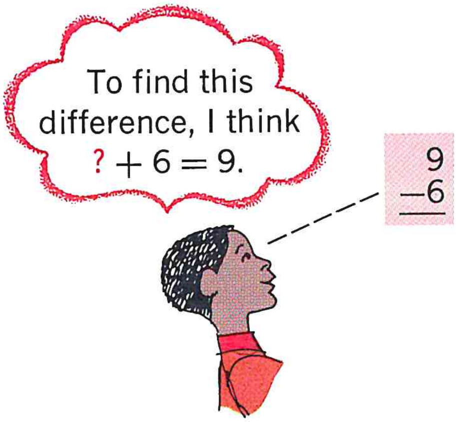
EXERCISES

1. Find the missing addends.

[A]


To find this difference, I think ? + 3 = 7.
7 − 3

[B]


To find this difference, I think ? + 6 = 9.
9
−6

2. Find the missing addends.

[A] $\boxed{n} + 4 = 7$
[B] $\boxed{n} + 3 = 10$
[C] $\boxed{n} + 4 = 9$
[D] $\boxed{n} + 6 = 10$
[E] $\boxed{n} + 4 = 8$
[F] $\boxed{n} + 5 = 10$
[G] $\boxed{n} + 6 = 9$
[H] $\boxed{n} + 1 = 7$
[I] $\boxed{n} + 0 = 8$
[J] $\boxed{n} + 7 = 10$
[K] $\boxed{n} + 4 = 5$
[L] $\boxed{n} + 3 = 9$

3. Find the differences.

Think
? + 4 = 7

[A] $7 - 4 = \boxed{n}$

Think
? + 3 = 10

[B] $10 - 3 = \boxed{n}$

Think
? + 4 = 9

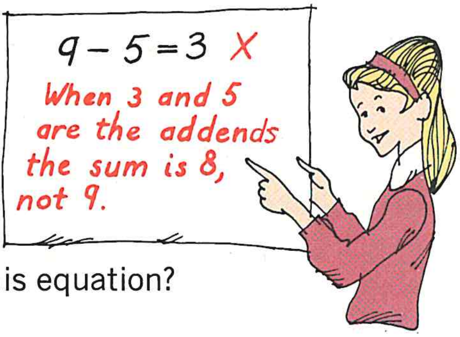
[C] $9 - 4 = \boxed{n}$

4. Find the differences.

[A] $10 - 6 = \boxed{n}$
[B] $8 - 4 = \boxed{n}$
[C] $10 - 5 = \boxed{n}$
[D] $9 - 6 = \boxed{n}$
[E] $7 - 1 = \boxed{n}$
[F] $8 - 0 = \boxed{n}$
[G] $10 - 7 = \boxed{n}$
[H] $5 - 4 = \boxed{n}$
[I] $9 - 3 = \boxed{n}$

DISCUSSION EXERCISES

The third-grade children checked their arithmetic papers. Kristy checked Jay's paper. Under one exercise, she wrote



1. Explain what Kristy was trying to tell Jay.
2. What do you think Kristy would say about this equation?

$$8 - 3 = \boxed{4}$$

EXERCISES

1. Find the differences. Use addition to check your answers.

[A] $8 - 4 = \boxed{n}$
[B] $10 - 9 = \boxed{n}$
[C] $9 - 4 = \boxed{n}$
[D] $7 - 4 = \boxed{n}$
[E] $10 - 4 = \boxed{n}$
[F] $10 - 8 = \boxed{n}$
[G] $7 - 7 = \boxed{n}$
[H] $7 - 1 = \boxed{n}$
[I] $6 - 2 = \boxed{n}$
[J] $9 - 7 = \boxed{n}$
[K] $9 - 3 = \boxed{n}$
[L] $5 - 2 = \boxed{n}$

2. Give the missing numbers. Check your answer.

7	−3	4	+2	6	−4	[A]	+8	[B]	−1	[C]	−5	4
2	+6	8	+2	10	−9	[D]	+4	[E]	+2	[F]	−7	0

3. Find the differences. Check your answers.

[A] $\begin{array}{r}10\\-6\\\hline\end{array}$ [B] $\begin{array}{r}10\\-3\\\hline\end{array}$ [C] $\begin{array}{r}8\\-2\\\hline\end{array}$ [D] $\begin{array}{r}9\\-4\\\hline\end{array}$

[E] $\begin{array}{r}6\\-3\\\hline\end{array}$ [F] $\begin{array}{r}7\\-3\\\hline\end{array}$ [G] $\begin{array}{r}5\\-5\\\hline\end{array}$ [H] $\begin{array}{r}9\\-7\\\hline\end{array}$

[I] $\begin{array}{r}9\\-3\\\hline\end{array}$ [J] $\begin{array}{r}8\\-1\\\hline\end{array}$ [K] $\begin{array}{r}6\\-0\\\hline\end{array}$ [L] $\begin{array}{r}9\\-2\\\hline\end{array}$

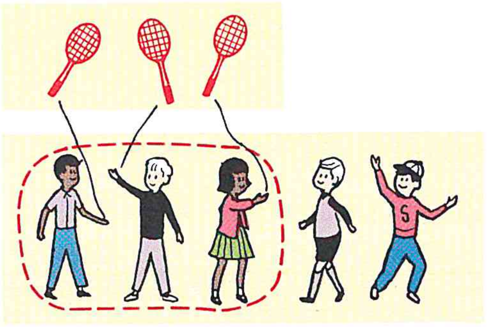
[M] $\begin{array}{r}9\\-5\\\hline\end{array}$ [N] $\begin{array}{r}10\\-7\\\hline\end{array}$ [O] $\begin{array}{r}10\\-5\\\hline\end{array}$ [P] $\begin{array}{r}10\\-8\\\hline\end{array}$

Think

Addition is my dearest friend.
We never fuss or fight.
When I am done,
He comes and checks
To see that I am right.

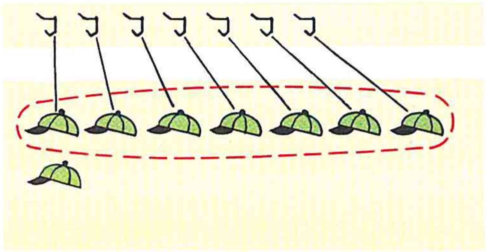
WHO AM I?

Comparing sets



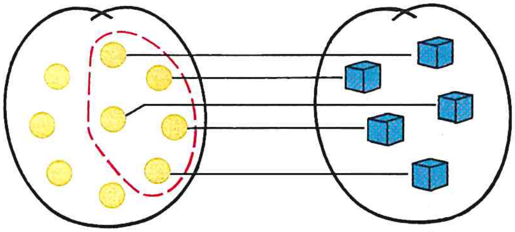
How many more children are there than rackets? You can draw matching lines to show that the answer is ▥. Also, you can think about subtraction.

$5 - 3 = \boxed{n}$



How many more caps are there than hooks? By matching we see there are ▥ more caps than hooks. Here is the subtraction equation.

$8 - 7 = \boxed{n}$



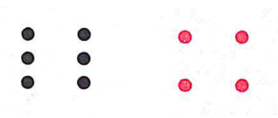
How many more balls are there than blocks? The matching lines show there are ▥ more balls than blocks. Also, you can use subtraction.

$9 - 5 = \boxed{n}$

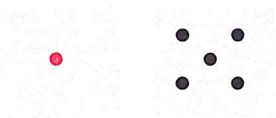
EXERCISES

For each pair of sets, there are more black dots than red dots. Write a subtraction equation for each pair to tell how many more black dots.

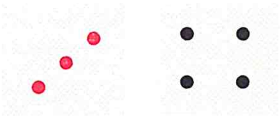
1.



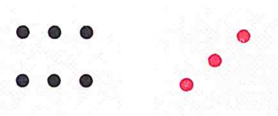
2.



3.



4.



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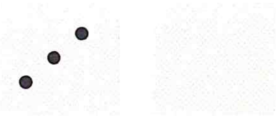
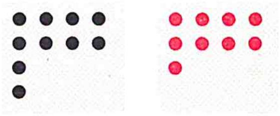
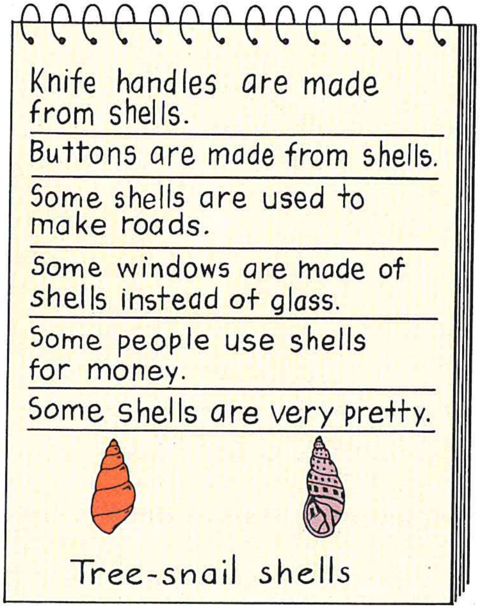


6.



Collecting shells

Nan collects shells. She also collects facts about shells. Page 1 in her notebook looked like this.



Knife handles are made from shells.

Buttons are made from shells.

Some shells are used to make roads.

Some windows are made of shells instead of glass.

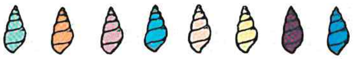
Some people use shells for money.

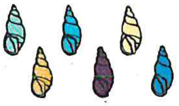
Some shells are very pretty.

Tree-snail shells

1. Nan collected 5 tree-snail shells and 3 clam shells. How many more tree-snail shells does she have than clam shells?

2. Nan and Jill went to the beach to look for shells. Nan placed her shells in a row like this. Jill placed her shells like this. [A] Who had more shells? [B] How many more?





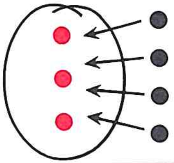
3. Nan found 9 mussel shells near the pond. She gave 4 of them to Jill. How many did Nan have left?

4. Nan wants pictures of her shells. She has 9 different snail shells. She has pictures of 7 of them. How many more pictures does she need?

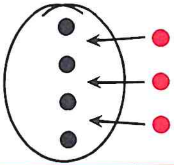
5. Nan took 8 colored shells to school. She had 3 colored shells at home. She had fewer colored shells at home than at school. How many fewer?

6. Jill had 4 blue shells and 3 white shells in a box. She gave Nan 5 of these shells. How many shells does Jill have left in the box?

The order principle for addition

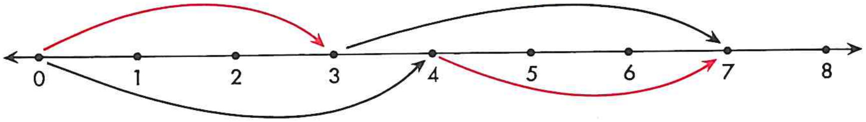


$3 + 4 = \boxed{n}$



$4 + 3 = \boxed{n}$

$3 + 4 = \boxed{n}$



$4 + 3 = \boxed{n}$

DISCUSSION EXERCISES

1. Find each sum in the equations above.

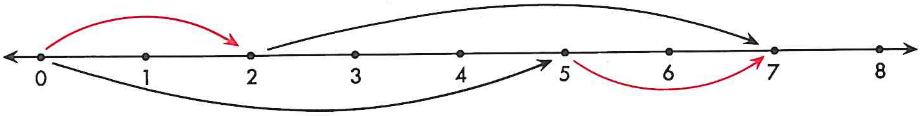
2. Whenever 3 and 4 are the addends, what is the sum?

When we change the order of the **ADDENDS**, we get the same **SUM.**

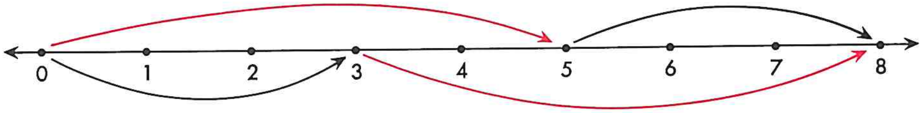
EXERCISES

1. The number line in part **A** shows that $2 + 5 = 5 + 2$. What does the number line in part **B** show?

[A]



[B]



2. Solve the equations.

[A] $4 + 6 = 6 + \boxed{n}$

[B] $5 + \boxed{n} = 3 + 5$

[C] $\boxed{n} + 8 = 8 + 9$

[D] $7 + 9 = \boxed{n} + 7$

[E] $327 + \boxed{n} = 22 + 327$

[F] $9856 + 6542 = \boxed{n} + 9856$

3. Find the sums.

[A] Since $95 + 87 = 182$, we know that $87 + 95 = \boxed{n}$.

[B] Since $137 + 387 = 524$, we know that $387 + 137 = \boxed{n}$.

[C] Since $792 + 843 = 1635$, we know that $843 + 792 = \boxed{n}$.

The grouping principle for addition

Addends: 3, 5, 2

We could add these first.

$\overset{\searrow}{3} + \overset{\swarrow}{5} + 2$

$({\color{red}}3 + 5) + 2$

We think: $8 + 2 = 10$

or

We could add these first.

$3 + \overset{\searrow}{5} + \overset{\swarrow}{2}$

$3 + (5 + 2)$

We think: $3 + 7 = 10$

When we change the grouping of the **ADDENDS**, we get the same **SUM.**

EXERCISES

1. Find the sums. Use the grouping shown by arrows.

[A] $\{\overset{\searrow}{1}, \overset{\swarrow}{5}, 2\}$
[B] $\{\overset{\searrow}{3}, \overset{\swarrow}{4}, 2\}$
[C] $\{1, \overset{\searrow}{5}, \overset{\swarrow}{2}\}$
[D] $\{3, \overset{\searrow}{4}, \overset{\swarrow}{2}\}$
[E] $\{\overset{\searrow}{2}, \overset{\swarrow}{4}, 1\}$
[F] $\{5, \overset{\searrow}{3}, \overset{\swarrow}{2}\}$
[G] $\{2, \overset{\searrow}{4}, \overset{\swarrow}{1}\}$
[H] $\{\overset{\searrow}{5}, \overset{\swarrow}{3}, 2\}$

2. The last two addends are grouped in the problems below. By changing the grouping, you can find the same sum more easily.

[A] $7 + (3 + 5)$
[B] $8 + (2 + 7)$
[C] $6 + (4 + 8)$
[D] $59 + (1 + 7)$
[E] $78 + (2 + 6)$
[F] $8 + (2 + 6)$
[G] $4 + (6 + 3)$
[H] $5 + (5 + 3)$
[I] $999 + (1 + 235)$
[J] $99 + (1 + 532)$
[K] $6 + (4 + 8321)$
[L] $7 + (3 + 8267)$

3. Solve these equations.

[A] $(5 + 3) + \boxed{n} = 5 + (3 + 2)$
[B] $(\boxed{n} + 29) + 67 = 48 + (29 + 67)$

4. Find the sums.

[A] Since $(35 + 27) + 68 = 130$, we know that $35 + (27 + 68) = \boxed{n}$.
[B] Since $(56 + 39) + 28 = 123$, we know that $56 + (39 + 28) = \boxed{n}$.
[C] Since $24 + (43 + 92) = 159$, we know that $(24 + 43) + 92 = \boxed{n}$.

Rearranging addends

Think about 3 addends. 2 4 3

When we change the **order** of the addends, we get the same sum.

When we change the **grouping** of the addends, we get the same sum.

When we use these principles together, we begin by adding any two numbers.

We could add these first.	We could add these first.	We could add these first.
↘ ↙	↘ ↙	↘ ↙
2 4 3	2 4 3	2 4 3
[A] $(2+4)+3$	[E] $2+(4+3)$	[I] $(2+3)+4$
[B] $(4+2)+3$	[F] $2+(3+4)$	[J] $4+(2+3)$
[C] $3+(2+4)$	[G] $(4+3)+2$	[K] $(3+2)+4$
[D] $3+(4+2)$	[H] $(3+4)+2$	[L] $4+(3+2)$

DISCUSSION EXERCISES

1. What is each sum in the table above?

2. Whenever 2, 4, and 3 are the addends, what is the sum?

EXERCISES

1. Solve these equations for addends 2 3 5.

[A] $(2+3)+5=n$ [E] $(5+2)+3=n$ [I] $(3+5)+2=n$
[B] $2+(3+5)=n$ [F] $5+(2+3)=n$ [J] $3+(5+2)=n$
[C] $2+(5+3)=n$ [G] $5+(3+2)=n$ [K] $3+(2+5)=n$
[D] $(2+5)+3=n$ [H] $(5+3)+2=n$ [L] $(3+2)+5=n$

2. However we order or group,

[A] when the addends are 2 4 3, the sum is ▒.
[B] when the addends are 2 3 5, the sum is ▒.
[C] when the addends are 4 1 2, the sum is ▒.
[D] when the addends are 2 5 0, the sum is ▒.

Finding sums of ten

Since we can change **order** and **grouping** and still get the same sum, we may **add any two** numbers first. We could think like this to find 6 + 3 + 4.

$$\searrow 6 + 3 + 4 \swarrow$$

Think: 10 and 3
Write: 13

or

$$\begin{array}{rl} \rightarrow & 6 \\ & 3 \\ \rightarrow & 4 \\ \hline & 13 \leftarrow \text{Write} \end{array}$$

Think: 10 and 3

1. Find the sums. Look for tens.

[A] 7 + 3 + 2
[B] 7 + 2 + 3
[C] 9 + 8 + 1
[D] 6 + 2 + 4
[E] 5 + 6 + 5
[F] 4 + 6 + 9
[G] 7 + 8 + 2
[H] 5 + 7 + 3
[I] 6 + 3 + 1
[J] 5 + 2 + 8
[K] 8 + 5 + 2
[L] 9 + 5 + 5
[M] 10 + 0 + 8
[N] 2 + 5 + 2
[O] 3 + 5 + 5
[P] 1 + 6 + 9

2. Find the sums.

[A] $\begin{array}{r}8\\2\\+4\\\hline\end{array}$ [B] $\begin{array}{r}4\\2\\+8\\\hline\end{array}$ [C] $\begin{array}{r}4\\8\\+2\\\hline\end{array}$ [D] $\begin{array}{r}8\\4\\+2\\\hline\end{array}$ [E] $\begin{array}{r}7\\5\\+3\\\hline\end{array}$ [F] $\begin{array}{r}9\\9\\+1\\\hline\end{array}$ [G] $\begin{array}{r}8\\2\\+8\\\hline\end{array}$ [H] $\begin{array}{r}6\\0\\+4\\\hline\end{array}$ [I] $\begin{array}{r}4\\6\\+9\\\hline\end{array}$

3. Find the sums. Look for tens.

[A] 2 + 8 + 3 + 4
[B] 2 + 3 + 8 + 4
[C] 9 + 5 + 1 + 5
[D] 2 + 3 + 4 + 8
[E] 4 + 6 + 3 + 3
[F] 2 + 4 + 8 + 2
[G] 4 + 3 + 3 + 6
[H] 7 + 4 + 3 + 5
[I] 7 + 6 + 2 + 4

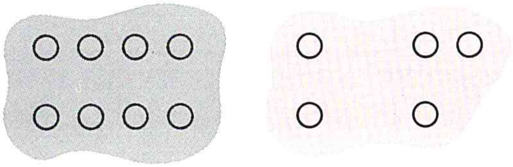
4. Find the sums.

[A] $\begin{array}{r}9\\7\\1\\+2\\\hline\end{array}$ [B] $\begin{array}{r}8\\2\\3\\+1\\\hline\end{array}$ [C] $\begin{array}{r}5\\7\\3\\+2\\\hline\end{array}$ [D] $\begin{array}{r}6\\4\\7\\+3\\\hline\end{array}$ [E] $\begin{array}{r}6\\7\\4\\+3\\\hline\end{array}$

Sums between 10 and 19

You can use what you have learned about grouping to find the sum $8 + 5$. Study the following example and give the missing numbers.

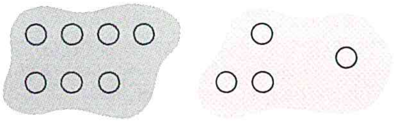
$$8 + 5$$

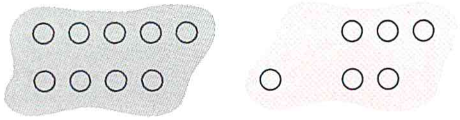


$$8 + (2 + 3) = 10 + \boxed{}$$
$$8 + 5 = \boxed{}$$

EXERCISES

1. Solve the equations.





[A] $7 + (3 + 1) = 10 + \boxed{n}$
[B] $7 + (3 + 1) = \boxed{n}$
[C] $7 + 4 = \boxed{n}$

[D] $9 + (1 + 5) = 10 + \boxed{n}$
[E] $9 + (1 + 5) = \boxed{n}$
[F] $9 + 6 = \boxed{n}$

2. Find the missing numbers.

[A] $7 + 6 = 10 + \boxed{n}$
[B] $9 + 5 = 10 + \boxed{n}$
[C] $8 + 4 = 10 + \boxed{n}$
[D] $6 + 5 = 10 + \boxed{n}$
[E] $7 + 5 = 10 + \boxed{n}$
[F] $8 + 6 = 10 + \boxed{n}$
[G] $9 + 3 = 10 + \boxed{n}$
[H] $7 + 4 = 10 + \boxed{n}$
[I] $8 + 5 = 10 + \boxed{n}$
[J] $6 + 6 = 10 + \boxed{n}$
[K] $8 + 7 = 10 + \boxed{n}$
[L] $9 + 7 = 10 + \boxed{n}$

3. Find the sums.

[A] $8 + 3$
[B] $9 + 2$
[C] $7 + 6$
[D] $8 + 4$
[E] $7 + 5$
[F] $9 + 6$
[G] $8 + 5$
[H] $9 + 4$
[I] $7 + 7$
[J] $8 + 8$
[K] $9 + 9$
[L] $7 + 4$
[M] $3 + 9$
[N] $5 + 7$
[O] $6 + 8$
[P] $7 + 9$
[Q] $8 + 6$
[R] $5 + 6$

4. These sums are called the **doubles.** Find the sums as quickly as you can.

[A] $\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$ [B] $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ [C] $\begin{array}{r} 3 \\ +3 \\ \hline \end{array}$ [D] $\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$ [E] $\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$ [F] $\begin{array}{r} 2 \\ +2 \\ \hline \end{array}$ [G] $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$ [H] $\begin{array}{r} 9 \\ +9 \\ \hline \end{array}$

5. The double for 12 is $6 + 6$. Give the double for each of these numbers.

[A] 10 [B] 6 [C] 14 [D] 8 [E] 18 [F] 16 [G] 2 [H] 0

6. Read each exercise carefully. Then give the sum.

[A] Because $4 + 4 = 8$, we know that $4 + 5 = \boxed{n}$.
[B] Because $7 + 7 = 14$, we know that $7 + 6 = \boxed{n}$.
[C] Because $5 + 5 = 10$, we know that $5 + 6 = \boxed{n}$.
[D] Because $6 + 6 = 12$, we know that $6 + 7 = \boxed{n}$.
[E] Because $9 + 9 = 18$, we know that $9 + 8 = \boxed{n}$.
[F] Because $8 + 8 = 16$, we know that $8 + 9 = \boxed{n}$.
[G] Because $6 + 6 = 12$, we know that $6 + 5 = \boxed{n}$.
[H] Because $7 + 7 = 14$, we know that $6 + 8 = \boxed{n}$.
[I] Because $8 + 8 = 16$, we know that $7 + 9 = \boxed{n}$.
[J] Because $6 + 6 = 12$, we know that $5 + 7 = \boxed{n}$.

7. Give the sums.

[A] $\begin{array}{r} 3 \\ 4 \\ +5 \\ \hline \end{array}$ [B] $\begin{array}{r} 5 \\ 3 \\ +7 \\ \hline \end{array}$

[C] $\begin{array}{r} 5 \\ 1 \\ +9 \\ \hline \end{array}$ [D] $\begin{array}{r} 5 \\ 4 \\ +6 \\ \hline \end{array}$

[E] $\begin{array}{r} 3 \\ 2 \\ +6 \\ \hline \end{array}$ [F] $\begin{array}{r} 8 \\ 0 \\ +9 \\ \hline \end{array}$

8. Find the sums.

[A] $\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$ [B] $\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$ [C] $\begin{array}{r} 9 \\ +4 \\ \hline \end{array}$ [D] $\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$

[E] $\begin{array}{r} 8 \\ +1 \\ \hline \end{array}$ [F] $\begin{array}{r} 4 \\ +6 \\ \hline \end{array}$ [G] $\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$ [H] $\begin{array}{r} 9 \\ +8 \\ \hline \end{array}$

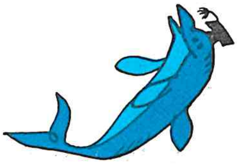
[I] $\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$ [J] $\begin{array}{r} 2 \\ +7 \\ \hline \end{array}$ [K] $\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$ [L] $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$

[M] $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ [N] $\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$ [O] $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$ [P] $\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$

Think

I'm quite a tiny number.
So very small indeed.
If you add me to another,
A change you cannot read.

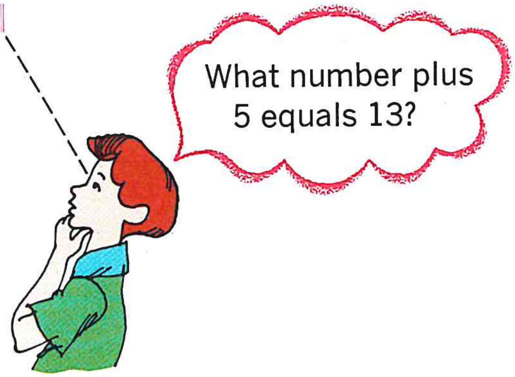
WHO AM I?



Finding differences again

You can find differences if you can find missing addends.

$13 - 5 = \boxed{n}$


What number plus 5 equals 13?

EXERCISES

1. Read carefully. Then find the difference.

[A] Because $6 + 7 = 13$, we know that $13 - 7 = \boxed{n}$.
[B] Because $8 + 7 = 15$, we know that $15 - 7 = \boxed{n}$.
[C] Because $9 + 5 = 14$, we know that $14 - 5 = \boxed{n}$.
[D] Because $8 + 6 = 14$, we know that $14 - 6 = \boxed{n}$.
[E] Because $9 + 7 = 16$, we know that $16 - 7 = \boxed{n}$.

2. Read carefully. Then find the difference.

[A] Because $48 + 37 = 85$, we know that $85 - 37 = \boxed{n}$.
[B] Because $76 + 88 = 164$, we know that $164 - 88 = \boxed{n}$.
[C] Because $57 + 19 = 76$, we know that $76 - 19 = \boxed{n}$.
[D] Because $95 + 83 = 178$, we know that $178 - 83 = \boxed{n}$.

3. Read carefully. Then find the missing number.

[A] To find $15 - 7$, it helps to think $\boxed{n} + 7 = 15$.
[B] To find $17 - 9$, it helps to think $\boxed{n} + 9 = 17$.
[C] To find $14 - 6$, it helps to think $\boxed{n} + 6 = 14$.
[D] To find $12 - 7$, it helps to think $\boxed{n} + 7 = 12$.

4. Find the differences.

[A] $\begin{array}{r} 11 \\ -6 \\ \hline \end{array}$ [B] $\begin{array}{r} 12 \\ -4 \\ \hline \end{array}$ [C] $\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$ [D] $\begin{array}{r} 13 \\ -9 \\ \hline \end{array}$ [E] $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ [F] $\begin{array}{r} 14 \\ -9 \\ \hline \end{array}$ [G] $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$ [H] $\begin{array}{r} 16 \\ -8 \\ \hline \end{array}$

Finding sums and differences

1. Find the differences.

[A] $12 - 4 = \boxed{n}$
[B] $11 - 5 = \boxed{n}$
[C] $13 - 6 = \boxed{n}$
[D] $14 - 5 = \boxed{n}$
[E] $14 - 7 = \boxed{n}$
[F] $15 - 8 = \boxed{n}$
[G] $16 - 9 = \boxed{n}$
[H] $12 - 6 = \boxed{n}$
[I] $11 - 8 = \boxed{n}$
[J] $17 - 8 = \boxed{n}$
[K] $12 - 7 = \boxed{n}$
[L] $13 - 9 = \boxed{n}$

2. Find the sums and differences. Use any method you choose.

[A] $\begin{array}{r} 8 \\ +2 \\ \hline \end{array}$
[B] $\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$
[C] $\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$
[D] $\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$
[E] $\begin{array}{r} 12 \\ -3 \\ \hline \end{array}$
[F] $\begin{array}{r} 14 \\ -6 \\ \hline \end{array}$
[G] $\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$
[H] $\begin{array}{r} 8 \\ +0 \\ \hline \end{array}$

[I] $\begin{array}{r} 13 \\ -4 \\ \hline \end{array}$
[J] $\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$
[K] $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$
[L] $\begin{array}{r} 17 \\ -7 \\ \hline \end{array}$
[M] $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$
[N] $\begin{array}{r} 6 \\ +8 \\ \hline \end{array}$
[O] $\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$
[P] $\begin{array}{r} 7 \\ +3 \\ \hline \end{array}$

[Q] $\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$
[R] $\begin{array}{r} 10 \\ +8 \\ \hline \end{array}$
[S] $\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$
[T] $\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$
[U] $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$
[V] $\begin{array}{r} 9 \\ +9 \\ \hline \end{array}$
[W] $\begin{array}{r} 16 \\ -6 \\ \hline \end{array}$
[X] $\begin{array}{r} 14 \\ -9 \\ \hline \end{array}$

3. Jane and Brenda played a game. Try to solve their puzzles.

[A] I'm thinking of a number. If you add 6 to it, you get 10. What is the number?

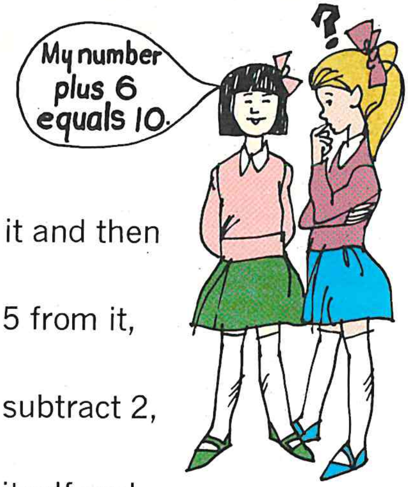
[B] I'm thinking of a number. If you add it to 4, you get 8. What is the number?

[C] I'm thinking of a number. If you add 3 to it and then add 2, you get 10. What is the number?

[D] I'm thinking of a number. If you subtract 5 from it, you get 10. What is the number?

[E] If you subtract 6 from a number and then subtract 2, you get 8. What is the number?

★ [F] I'm thinking of a number. If you add it to itself and then add 4, you get 10. What is the number?

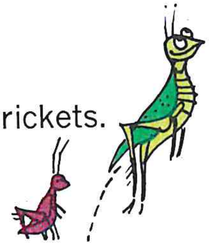


★ **4.** Solve the equations.

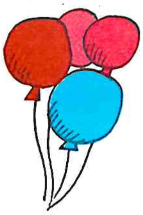
[A] $14 - \boxed{n} = 6$
[B] $5 + 8 = \boxed{n}$
[C] $17 - \boxed{n} = 10$
[D] $\boxed{n} - 6 = 9$
[E] $\boxed{n} + 6 = 11$
[F] $8 + \boxed{n} = 15$
[G] $\boxed{n} - 9 = 4$
[H] $6 + \boxed{n} = 10$
[I] $\boxed{n} + 8 = 17$
[J] $10 - \boxed{n} = 7$
[K] $2 + \boxed{n} = 10$
[L] $\boxed{n} + 9 = 13$

Short stories

1. 11 balloons. 3 blew away. How many left?
2. 5 girls with balloons. 9 girls without. How many girls?
3. Jumping contest. 9 grasshoppers. 7 crickets. How many in all?

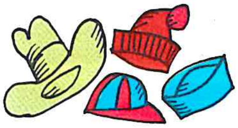


4. 5 merit badges. Need 14 in all. How many more needed?
5. 13 wins. 6 losses. How many more wins than losses?



6. 13 balloons. Stick 8 with a pin. How many left?
7. 8 cats. 13 monkeys. How many more monkeys than cats?
8. 9 points scored. 16 points needed to win the game. How many more points must be scored?
9. 10 fingers. 10 toes. How many more fingers than toes?

10. 16 flies. 7 frogs. Each frog gets a fly. How many flies are left?
11. 8 girls. 8 shoes. How many more shoes do they need?
12. 12 peanuts. Ate 2 and drank milk. Ate 5 more. How many left?
13. 12 peanuts. Ate 2 and drank milk. Ate 5 more. How many eaten in all?
14. Caught 17 fish. 9 too small so threw them back. How many left?

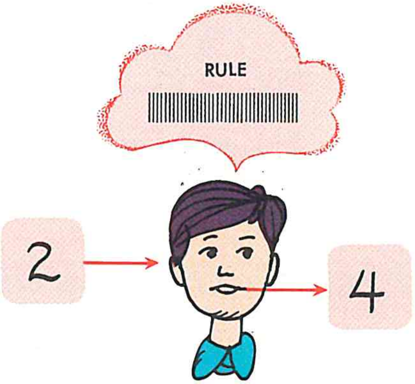


15. 14 boys. 6 hats. How many fewer hats than boys?
16. Had 15 cents. Spent 5 cents, and then spent 3 cents. How much left? How much spent?
17. Caught 12 butterflies. 7 got away. How many left?
18. 17 papers. Want to sell all but 10. How many must be sold?
19. Gave 8 valentines. Received 17 valentines. Gave how many fewer than received?
20. 13 newspapers. Sold 3 to women, and then sold 4 to men. How many customers? How many papers left?

Guess-the-rule games

Tom thought of a rule.
When Jane said 3, Tom answered 5.
When Jane said 8, Tom answered 10.
When Jane said 5, Tom answered 7.
When Jane said 2, what did Tom answer?
What rule do you think Tom was using?

Dick thought of a rule.
When Sue said 2, Dick answered 4.
When Sue said 5, Dick answered 10.
When Sue said 8, Dick answered 16.
Sue said 9. What did Dick answer?
What rule do you think Dick was using?



EXERCISES

Study the tables carefully. Guess the rule, then give what you think should go in each ▥.

1.

	Carol's number	Jill's answer
	4	14
	6	16
	2	12
[A]	7	▥
[B]	9	▥
[C]	▥	13
[D]	24	▥

2.

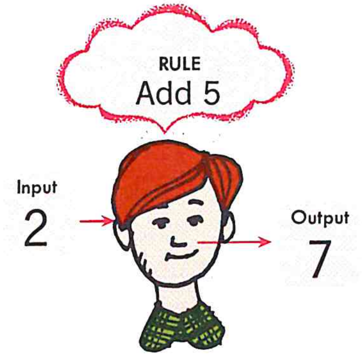
	Cindy's number	Nan's answer
	8	1
	7	0
	10	3
[A]	9	▥
[B]	▥	6
[C]	▥	8
[D]	▥	10

★ **3.**

	Cathy's number	Susan's answer
	2	0
	4	0
	3	1
	5	1
	8	0
[A]	6	▥
[B]	11	▥

The function machine

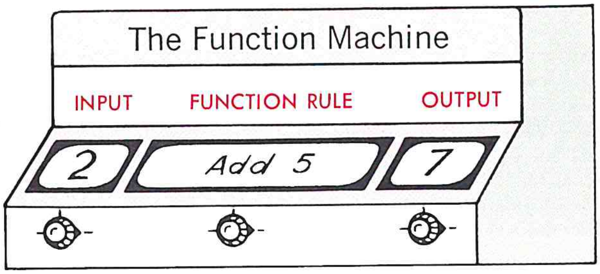
Study the pictures to see how the function machine works. A record of the operations of the function machine is shown below. Find the missing numbers.



Function Rule

Add 5

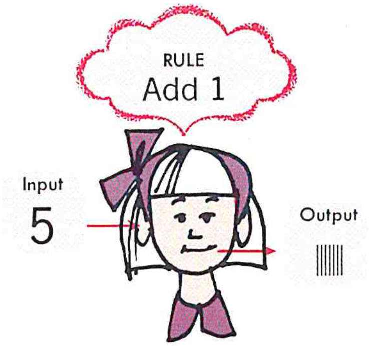
Input	Output
2	7
4	9
3	▥
6	▥



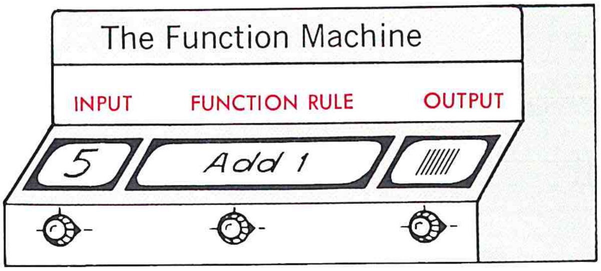
EXERCISES

Find each output number.

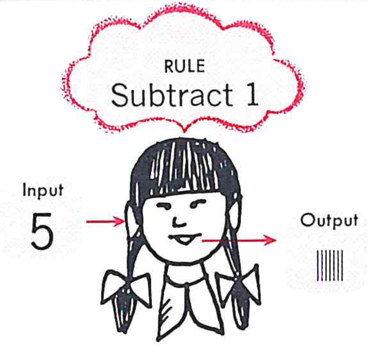
1.



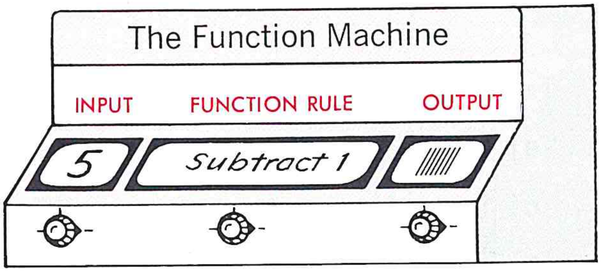
2.



3.



4.



EXERCISES

Think about the function machine and tell what you think should go in each gray space.

1. Function Rule

Add 5

	Input	Output
	2	7
	4	9
[A]	1	▥
[B]	5	▥
[C]	3	▥

2. Function Rule

Subtract 3

	Input	Output
[A]	6	▥
[B]	8	▥
[C]	10	▥
[D]	3	▥
[E]	13	▥

3. Function Rule

[A] ▥

	Input	Output
	2	6
	4	8
	7	11
[B]	8	▥
[C]	▥	13

4. Function Rule

Subtract 2

	Input	Output
	3	1
[A]	7	▥
[B]	▥	3
[C]	10	▥
[D]	▥	10

5. Function Rule

[A] ▥

	Input	Output
	7	1
	10	4
	6	0
[B]	9	▥
[C]	▥	8

6. Function Rule

Subtract 8

	Input	Output
	10	2
[A]	13	▥
[B]	15	▥
[C]	▥	3
[D]	17	▥

7. Function Rule

[A] ▥

	Input	Output
	2	10
	5	13
	7	15
[B]	3	▥
[C]	▥	17

8. Function Rule

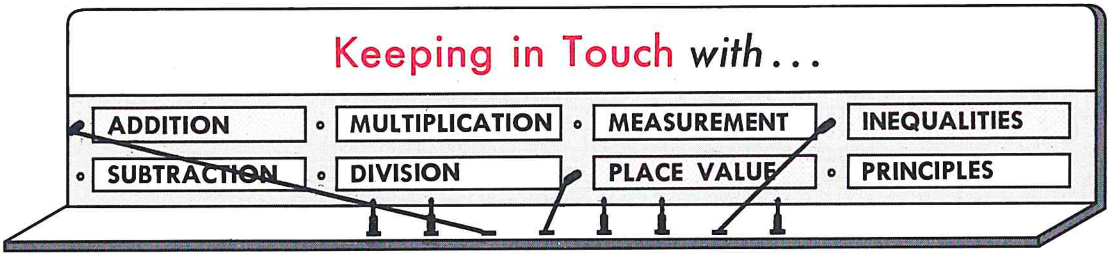
[A] ▥

	Input	Output
	0	9
	1	10
	9	18
[B]	7	▥
[C]	5	▥

9. Function Rule

If **odd**, subt. 1
If **even**, add 0

	Input	Output
	3	2
	2	2
	5	4
[A]	9	▥
[B]	8	▥



Keeping in Touch with...

1. Write the missing numerals.

[A] For 3 tens and 6, we write ▨.
[B] For 5 tens and 0, we write ▨.
[C] For 1 ten and 8, we write ▨.
[D] For 0 tens and 8, we write ▨.
[E] 60 means 6 tens and ▨.
[F] For 7 tens and 4, we write ▨.
[G] 28 means 2 tens and ▨.
[H] 46 means ▨ tens and 6.

2. Give the missing words.

[A] In 1847, the 4 means four _?_.
[B] In 6253, the 6 means six _?_.
[C] In 2584, the 5 means five _?_.
[D] In 3475, the 7 means seven _?_.

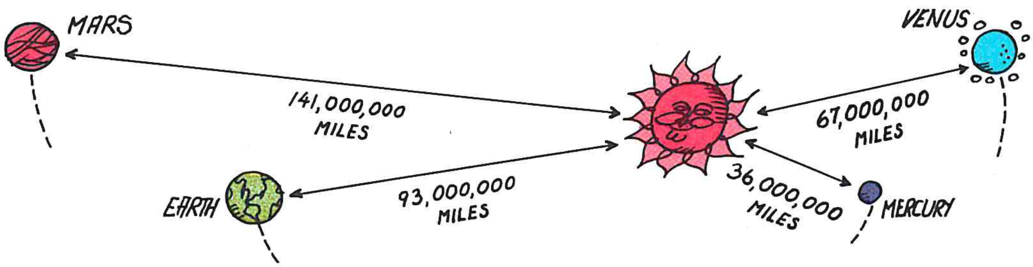
3. Solve the equations.

[A] $63 = 60 + \boxed{n}$
[B] $10 + 7 = \boxed{n}$
[C] $60 + 2 = \boxed{n}$
[D] $18 = \boxed{n} + 8$
[E] $70 = 70 + \boxed{n}$
[F] $15 = 10 + \boxed{n}$
[G] $80 + 0 = \boxed{n}$
[H] $30 + 4 = \boxed{n}$
[I] $67 = \boxed{n} + 7$

4. In each pair, which number is larger?

[A] 624	[B] 283	[C] 4284	[D] 9999	[E] 26,354
621	300	4384	10,000	26,364

★**5.**



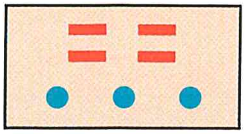
[A] Which of these planets is farthest from the sun?

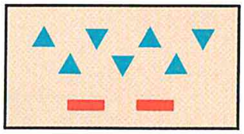
[B] Which of these planets is closest to the sun?

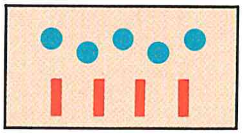
[C] The distance of a planet from the sun is not always the same. How far would the earth be from the sun if it were a million miles closer than shown?

Chapter review

1. Write 2 addition and 2 subtraction equations for each set.

[A]


[B]


[C]


2. Find the sums and differences.

[A] $\begin{array}{r} 8 \\ +2 \\ \hline \end{array}$ [B] $\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$ [C] $\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$ [D] $\begin{array}{r} 2 \\ +5 \\ \hline \end{array}$ [E] $\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$ [F] $\begin{array}{r} 7 \\ -3 \\ \hline \end{array}$ [G] $\begin{array}{r} 6 \\ +4 \\ \hline \end{array}$ [H] $\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$

[I] $\begin{array}{r} 7 \\ -5 \\ \hline \end{array}$ [J] $\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$ [K] $\begin{array}{r} 0 \\ +6 \\ \hline \end{array}$ [L] $\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$ [M] $\begin{array}{r} 10 \\ -6 \\ \hline \end{array}$ [N] $\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$ [O] $\begin{array}{r} 10 \\ -3 \\ \hline \end{array}$ [P] $\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$

3. Find the differences.

[A] $7 - 3 = \boxed{n}$
[B] $13 - 9 = \boxed{n}$
[C] $11 - 3 = \boxed{n}$
[D] $15 - 6 = \boxed{n}$
[E] $15 - 7 = \boxed{n}$
[F] $12 - 9 = \boxed{n}$
[G] $16 - 8 = \boxed{n}$
[H] $13 - 6 = \boxed{n}$
[I] $14 - 7 = \boxed{n}$
[J] $13 - 5 = \boxed{n}$

4. Find the sums. Look for a sum of 10.

[A] $6 + 4 + 7$
[B] $8 + 7 + 3$
[C] $8 + 9 + 2$
[D] $5 + 7 + 5$
[E] $4 + 6 + 5$
[F] $7 + 8 + 3$
[G] $6 + 2 + 8$
[H] $9 + 8 + 1$
[I] $6 + 7 + 4$
[J] $1 + 9 + 5$

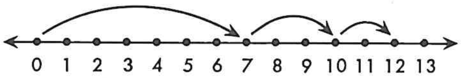
5. Find the missing numbers.

[A] If $47 + 38 = 85$, then $85 - 38 = \boxed{n}$.
[B] If $92 - 18 = 74$, then $74 + 18 = \boxed{n}$.
[C] $27 + 68 = 68 + \boxed{n}$
[D] $(39 + 27) + 68 = 39 + (\boxed{n} + 68)$

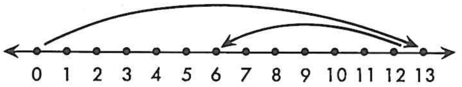
★6. Should the ◍ be + or −?

[A] $9 - (5 - 2) = (9 - 5)$ ◍ 2
[B] $12 - (8 + 3) = (12 - 8)$ ◍ 3

7. Use the number line to help you solve each equation.

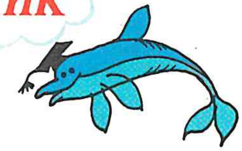
[A]


$7 + \boxed{n} + 2 = 12$

[B]


$13 - \boxed{n} = 6$

Think



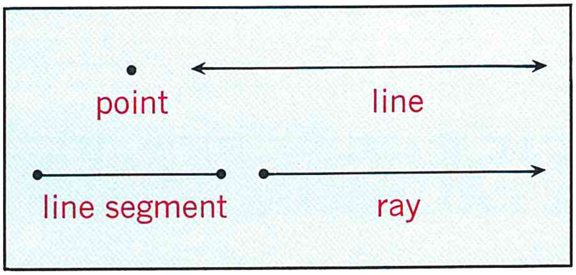
Increase me by 5.
Then take away 7.
When you are done,
You should have 11.

WHO AM I?

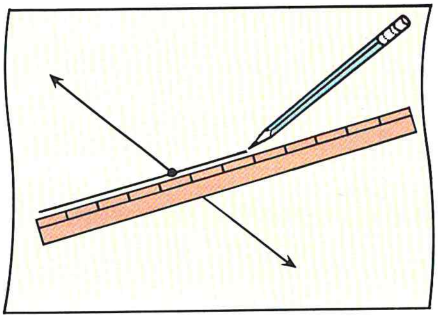
GEOMETRY Unit 1

Some figures of geometry

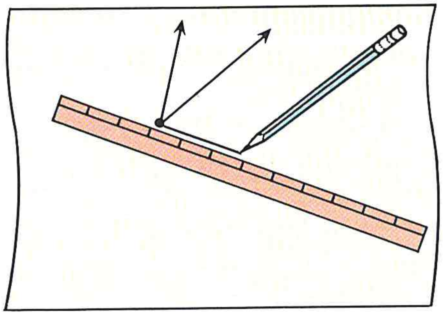
Some of the basic figures of geometry are pictured at the right. Other figures of geometry are made up of these figures.



1. Mark a point on your paper. Use your ruler to draw 5 different lines that pass through that point.

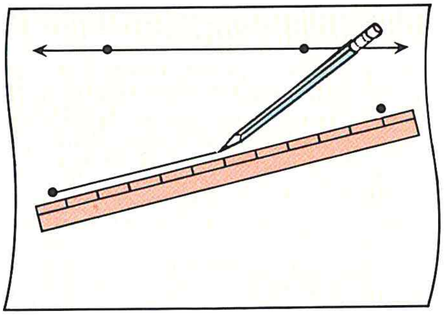


2. Mark a point on your paper. Use your ruler to draw 3 different rays from that point.



3. [A] Mark two points on your paper. Use your ruler to draw **the** line that passes through these two points.

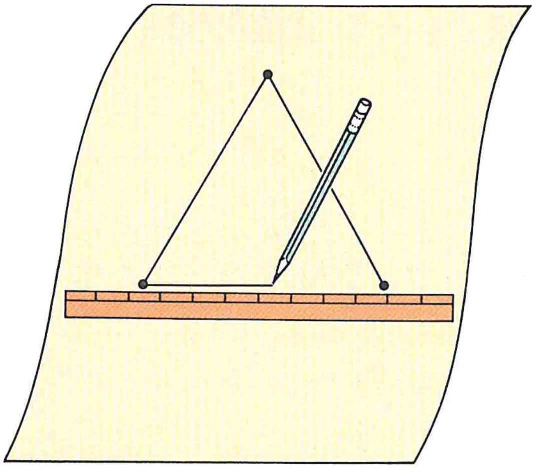
[B] Mark two other points on your paper. Draw the line segment for these points.

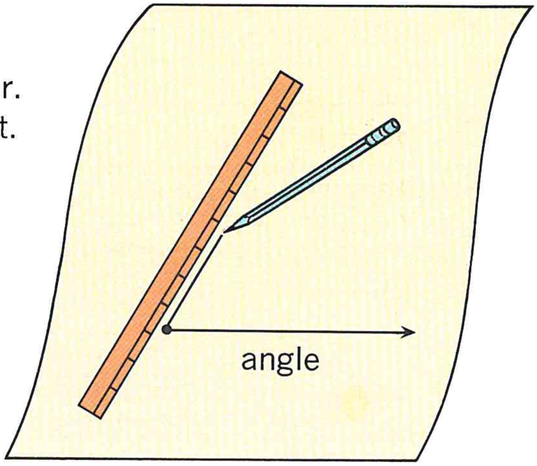


4. Mark 3 points as in the figure. Draw line segments to connect those points.

[A] How many segments did you draw?

[B] What is the name of the figure you have drawn?



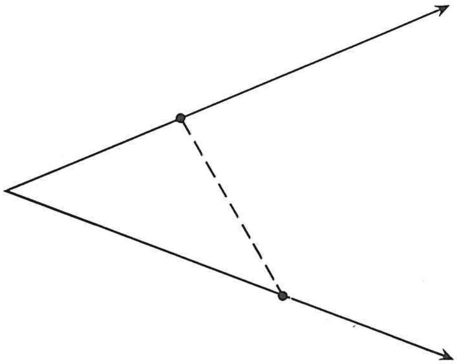


5. Mark one point on your paper. Draw two rays from this point. The figure you have drawn shows an **angle.**

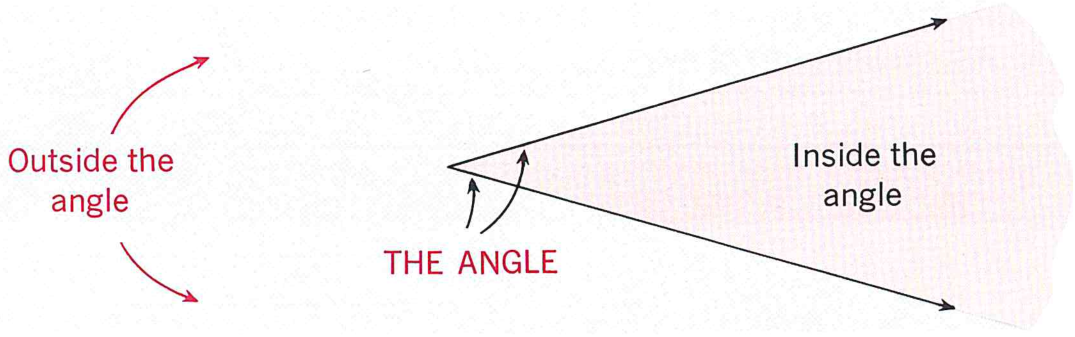
6. [A] Draw a figure that is made up of 4 line segments.

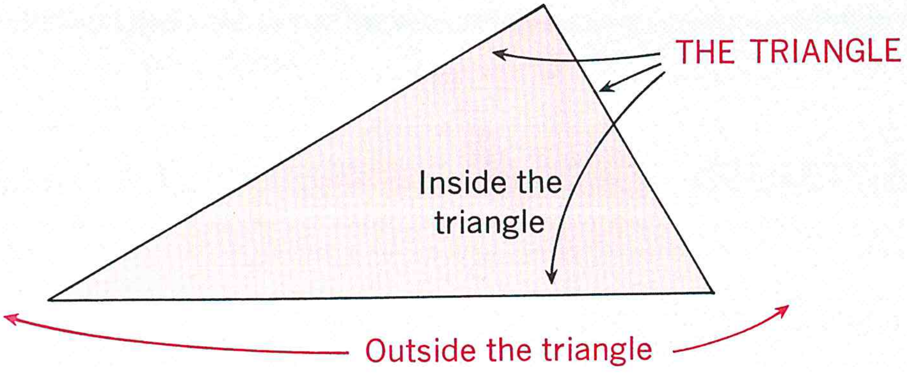
[B] Draw a figure that is made up of 5 segments.

7. Draw an angle. Mark a point on each ray of the angle. Connect these two points. Do you see a triangle? The angle forms one of the corners of the triangle. Each triangle has 3 sides (segments). Each triangle also has 3 _?_.

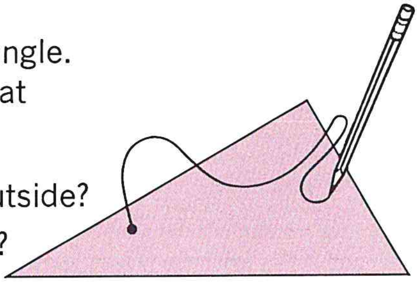


Angles and triangles





1. Draw a triangle and mark a point inside the triangle. Put your pencil on the point and draw a path that crosses a side of the triangle.



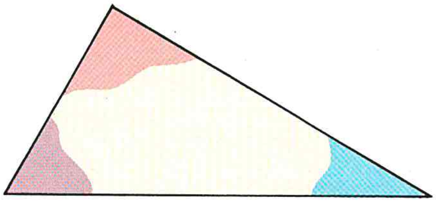
[A] Where is your pencil point now, inside or outside?

[B] Cross again. Where is the pencil point now?

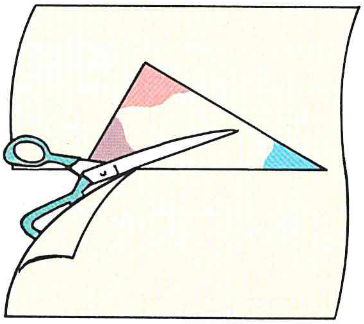
[C] If you cross 5 times in all, where are you?

[D] If you cross 8 times in all, where are you?

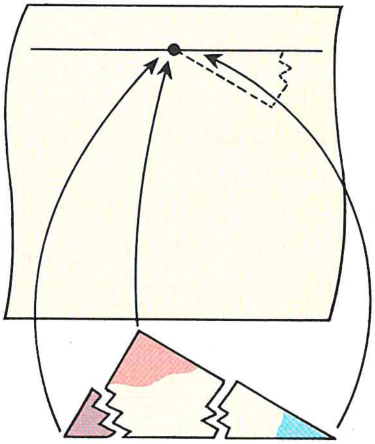
2. [A] Draw a triangle. Color each corner of the triangle a different color.



[B] Now cut out the triangle.



[C] Draw a line on another paper. Mark a point on the line. Tear the corners off your triangle. Then paste the 3 corners around the point like this.



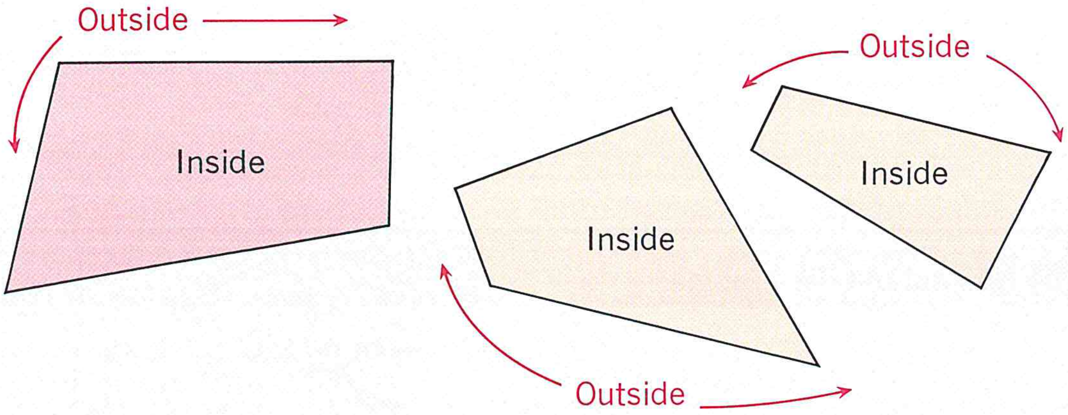
Make the edges touch, but do not let them overlap.

3. [A] Make another triangle and use 3 different colors to color the corners. This time paste your 3 corners around the same point you used before. Put these corners on the other side of the line.

[B] Did the 6 corners go all the way around the point?

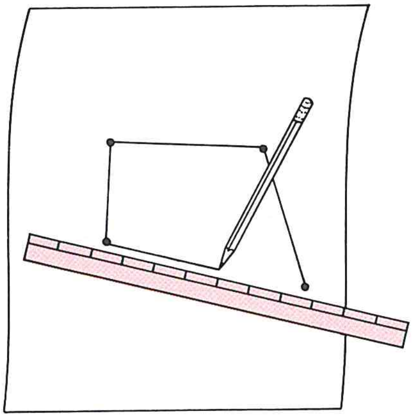
[C] Do you think this would happen if you did it again with other triangles of different shapes?

Quadrilaterals



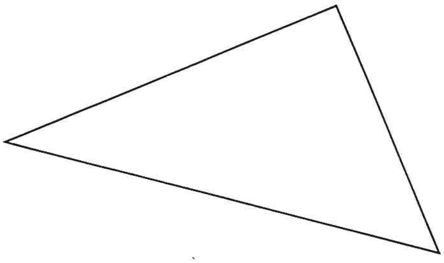
QUADRILATERALS

1. [A] Mark 4 points on your paper, as in the figure. Be sure that no 3 of them are in a line. Now use your ruler to connect the points like this. When you finish, you will have a quadrilateral.



[B] Draw one segment on your figure so that you have divided the quadrilateral into two triangles.

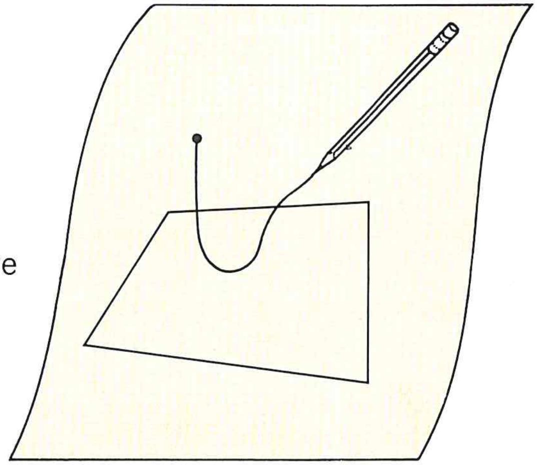
2. Draw a triangle. Draw one segment on this figure so that you have divided the triangle into a smaller triangle and a quadrilateral.



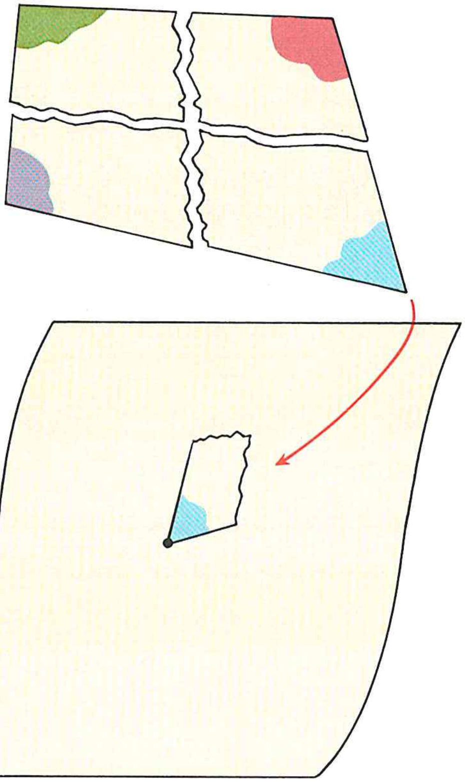
3. Draw a quadrilateral. Mark a point outside the quadrilateral. From this point, draw a path that crosses the quadrilateral 4 times.

   [A] Where will your pencil point be then, inside or outside?

   [B] If the path crosses 9 times, where will it end, inside or outside?



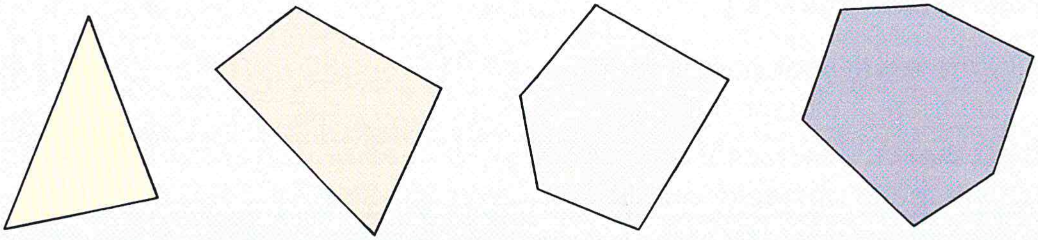
4. [A] Draw a quadrilateral. Color each corner of the quadrilateral a different color. Cut it out and tear off the 4 corners.



   [B] Mark a point on another piece of paper. Paste the corners around the point. Make the pieces touch but not overlap. Do these corners go completely around the point?

5. Try this again with a quadrilateral of a different shape.

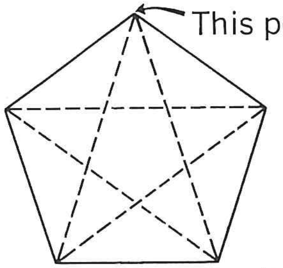
Polygons and diagonals



Triangle Quadrilateral Pentagon Hexagon

POLYGONS

The dotted lines in the figure show the **diagonals** of the polygon. How many diagonals does this polygon have? How many diagonals are there from each **vertex?**



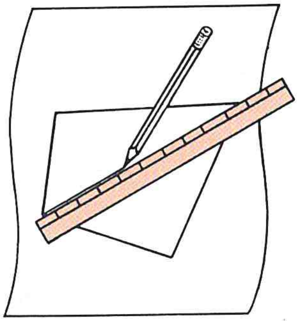
This point is one of the **vertices** of the polygon. It is called a **vertex** of the polygon.

1. Draw a 4-sided polygon (**quadrilateral**) on your paper.

   [A] Draw all the diagonals.

   [B] How many diagonals are there?

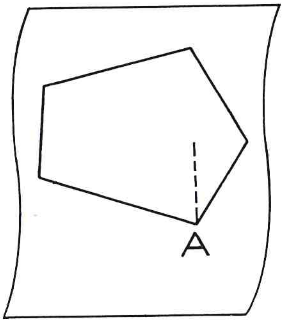
   [C] How many are there from each vertex?



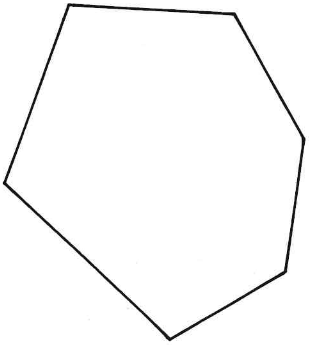
2. Draw a 5-sided polygon (**pentagon**) on your paper. Choose one vertex and label it *A*.

   [A] How many diagonals can you draw from *A*?

   [B] Can you draw the same number of diagonals from any vertex?



3. Before you try it on your paper, guess how many diagonals you can draw from one vertex of a 6-sided polygon (**hexagon**). Now draw this on your paper and see how well you guessed.



4. Here is a table showing what you have found so far.

Polygon	Number of diagonals from 1 vertex
3 sides	0
4 sides	1
5 sides	2
6 sides	3
7 sides	▥

[A] How many diagonals can you draw from one vertex of a 7-sided polygon?

[B] Draw a figure to show this.

★ **5.** [A] If a polygon has 10 sides, how many diagonals can you draw from each vertex?

[B] How many diagonals can you draw from one vertex of a 15-sided polygon?

[C] If you could draw just 10 diagonals from each vertex of a polygon, how many sides would it have?

[D] If you could draw just 15 diagonals from each vertex of a polygon, how many sides would it have?

★ **6.** Give the number of diagonals for each figure.

[A] pentagon [B] hexagon [C] a 10-sided polygon

CHAPTER 3 Adding and subtracting

Pennies and dimes

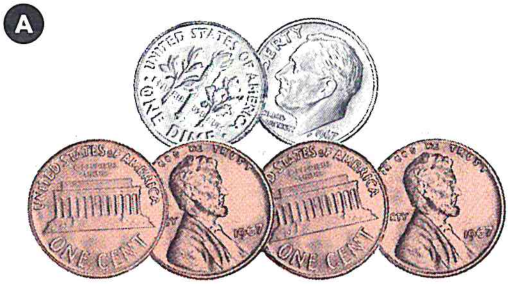
DISCUSSION EXERCISES

1. Which is worth more?

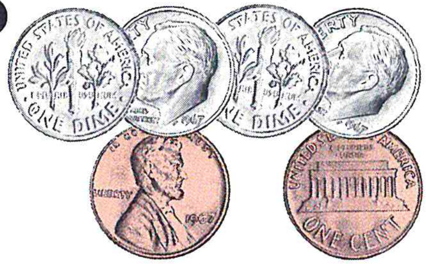
[**A**] 2 dimes or 19 pennies
[**B**] 32 pennies or 3 dimes
[**C**] 5 dimes or 48 pennies
[**D**] 6 dimes or 64 pennies
[**E**] 70 pennies or 8 dimes
[**F**] 91 pennies or 9 dimes
[**G**] 6 pennies or 1 dime
[**H**] 89 pennies or 9 dimes
[**I**] 1 dime or 90 pennies
[**J**] 9 dimes or 1 penny

2. What is the value of each collection below?

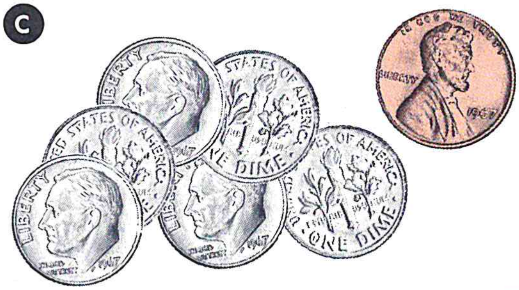
A



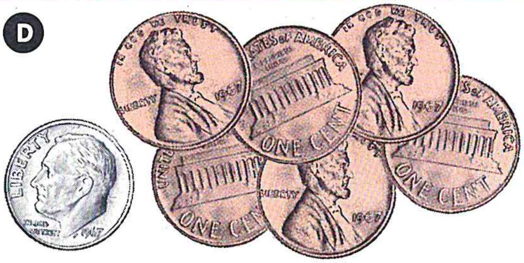
B



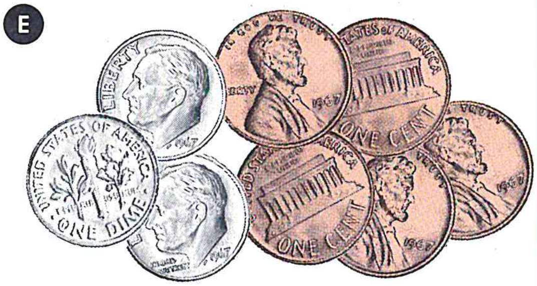
C



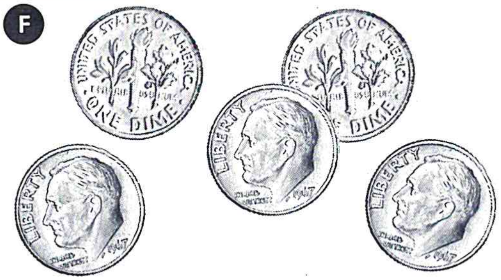
D



E



F



EXERCISES

1. For each part, tell which collection on page 52 has the greater value.

[A] A or B
[B] C or D
[C] E or F
[D] C or F
[E] B or E
[F] A or D
[G] C or E
[H] B or F

2. Give the value of each of the two coin collections together.

[A] A and B
[B] A and C
[C] C and D
[D] B and D
[E] B and E
[F] A and E
[G] D and F
[H] A and D
[I] D and E
[J] A and F
[K] C and E
[L] E and F

3. Which pair of collections has the greater value?

[A] A and B together or C and D together
[B] A and C together or B and D together
[C] A and E together or B and D together
[D] A and F together or C and D together
[E] B and F together or C and E together
[F] A and C together or B and E together

4. [A] Joe had 1 dime and 7 pennies.
He spent 5 cents.
How much did he have left?

[B] Jane had 2 dimes and 3 pennies.
She spent 1 dime and 3 cents.
How much did she have left?

[C] Sue had 6 dimes and 7 pennies.
She spent 5 dimes and 5 cents.
How much did she have left?

[D] Bill had 8 dimes and 2 pennies.
He spent 40 cents.
How much did he have left?

[E] Bob had 5 dimes and 9 pennies.
He spent 50 cents.
How much did he have left?

[F] Ann had 7 dimes and 6 pennies.
She spent 56 cents.
How much did she have left?

[G] Beth had 4 dimes and 8 pennies.
She spent 25 cents.
How much did she have left?

[H] Tom had 53 cents.
He spent 50 cents.
How much did he have left?

[I] Linda had 38 cents.
She spent 18 cents.
How much did she have left?

[J] Mike had 79 cents.
He spent 43 cents.
How much did he have left?

Sums: 10, 20, 30, 40, . . .

EXERCISES

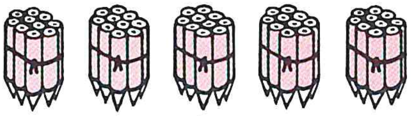
1. Answer each question. Then solve the equations.

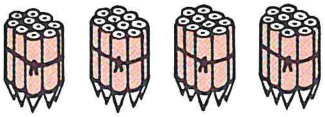
[A] 4 dimes together with 3 dimes make how many dimes?

[B] 4 tens and 3 tens make how many tens?

[C] $4 + 3 = \boxed{n}$ [D] $40 + 30 = \boxed{n}$

2.





[A] 5 bundles together with 4 bundles make how many bundles?

[B] 5 tens and 4 tens make how many tens?

[C] $5 + 4 = \boxed{n}$ [D] $50 + 40 = \boxed{n}$

3. Find the sums.

[A] Since $5 + 3 = 8$, we know that $50 + 30 = \boxed{n}$.
[B] Since $4 + 2 = 6$, we know that $40 + 20 = \boxed{n}$.
[C] Since $2 + 3 = 5$, we know that $20 + 30 = \boxed{n}$.
[D] Since $7 + 2 = 9$, we know that $70 + 20 = \boxed{n}$.
[E] Since $4 + 4 = 8$, we know that $40 + 40 = \boxed{n}$.
[F] Since $2 + 5 = 7$, we know that $20 + 50 = \boxed{n}$.
[G] Since $6 + 4 = 10$, we know that $60 + 40 = \boxed{n}$.
[H] Since $7 + 5 = 12$, we know that $70 + 50 = \boxed{n}$.
[I] Since $8 + 7 = 15$, we know that $80 + 70 = \boxed{n}$.
[J] Since $7 + 9 = 16$, we know that $70 + 90 = \boxed{n}$.

4. Solve the equations.

[A] $60 + 10 = \boxed{n}$

[B] $50 + 40 = \boxed{n}$

[C] $40 + 30 = \boxed{n}$

[D] $30 + 30 = \boxed{n}$

[E] $50 + 60 = \boxed{n}$

[F] $70 + 60 = \boxed{n}$

[G] $60 + 30 = \boxed{n}$

[H] $20 + 40 = \boxed{n}$

[I] $70 + 70 = \boxed{n}$

[J] $90 + 80 = \boxed{n}$

[K] $80 + 60 = \boxed{n}$

[L] $70 + 50 = \boxed{n}$

5. Solve the equations.

[A] $30 + 0 = \boxed{n}$

[B] $30 + 1 = \boxed{n}$

[C] $30 + 2 = \boxed{n}$

[D] $30 + 7 = \boxed{n}$

[E] $40 + 8 = \boxed{n}$

[F] $60 + 4 = \boxed{n}$

[G] $70 + 3 = \boxed{n}$

[H] $90 + 8 = \boxed{n}$

[I] $56 = 50 + \boxed{n}$

[J] $83 = 80 + \boxed{n}$

[K] $91 = 90 + \boxed{n}$

[L] $78 = 70 + \boxed{n}$

6. Find the sums.

[A] $2 + 3 + 4 = \boxed{n}$

[B] $6 + 2 + 7 = \boxed{n}$

[C] $4 + 5 + 3 = \boxed{n}$

[D] $1 + 7 + 2 = \boxed{n}$

[E] $6 + 3 + 4 = \boxed{n}$

[F] $7 + 2 + 5 = \boxed{n}$

[G] $\begin{array}{r} 2 \\ 7 \\ +1 \\ \hline \end{array}$
[H] $\begin{array}{r} 3 \\ 5 \\ +4 \\ \hline \end{array}$
[I] $\begin{array}{r} 6 \\ 3 \\ +4 \\ \hline \end{array}$
[J] $\begin{array}{r} 6 \\ 2 \\ +7 \\ \hline \end{array}$
[K] $\begin{array}{r} 2 \\ 3 \\ +4 \\ \hline \end{array}$
[L] $\begin{array}{r} 7 \\ 2 \\ +5 \\ \hline \end{array}$

7. Find the sums.

[A] $\begin{array}{r} 20 \\ 30 \\ +40 \\ \hline \end{array}$
[B] $\begin{array}{r} 60 \\ 20 \\ +70 \\ \hline \end{array}$
[C] $\begin{array}{r} 40 \\ 50 \\ +30 \\ \hline \end{array}$

[D] $\begin{array}{r} 70 \\ 20 \\ +50 \\ \hline \end{array}$
[E] $\begin{array}{r} 50 \\ 50 \\ +50 \\ \hline \end{array}$
[F] $\begin{array}{r} 60 \\ 40 \\ +80 \\ \hline \end{array}$

[G] $\begin{array}{r} 20 \\ 30 \\ 20 \\ +10 \\ \hline \end{array}$
[H] $\begin{array}{r} 40 \\ 20 \\ 10 \\ +50 \\ \hline \end{array}$
[I] $\begin{array}{r} 60 \\ 10 \\ 20 \\ +70 \\ \hline \end{array}$

Think

With 2 minutes to play, this was the score. →

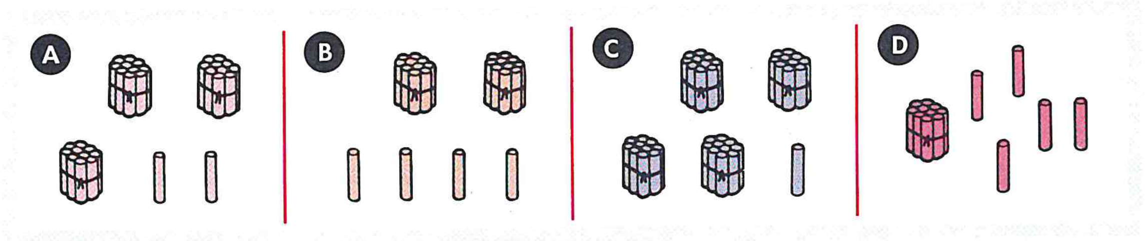
Lincoln School	48
Jefferson School	41

At the end of the game, the score was 50 to 47.

Who won the game?

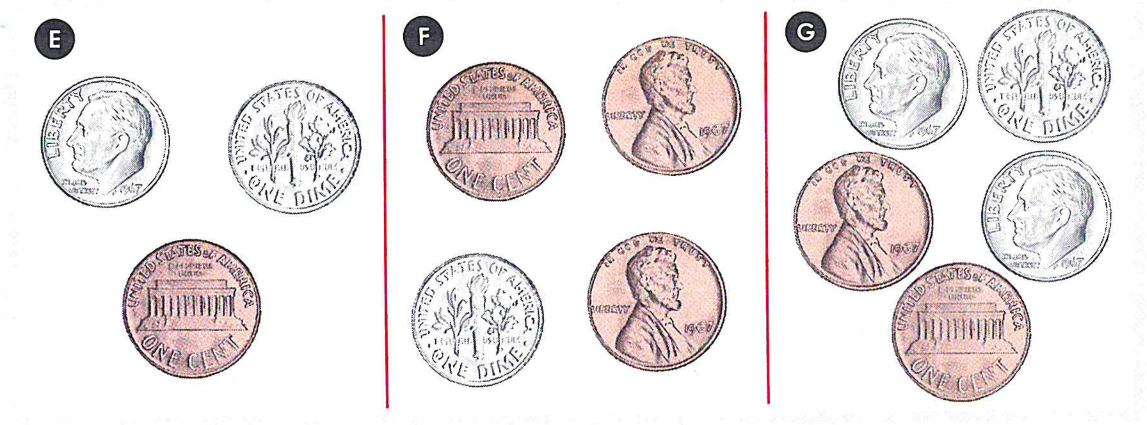
Addition: 2-digit numbers

EXERCISES



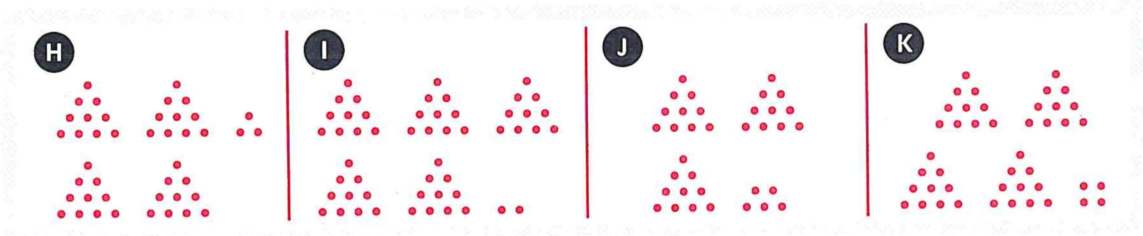
1. How many sticks are in these sets?

[A] A and B together
[B] B and C together
[C] A and C together
[D] C and D together
[E] A and D together
[F] B and D together



2. Give the value of each of the two collections together.

[A] E and F
[B] F and G
[C] E and G



3. How many dots are in these sets?

[A] H and I together
[B] I and J together
[C] H and J together
[D] I and K together
[E] H and K together
[F] J and K together

4. Find the sums.

[A] 20 + 30
20 + 30 + 4
20 + 30 + 4 + 5
20 + 4 + 30 + 5
24 + 30 + 5
24 + 35

[B] 40 + 10
40 + 10 + 2
40 + 10 + 2 + 6
40 + 2 + 10 + 6
40 + 2 + 16
42 + 16

[C] 50 + 30
50 + 30 + 1
50 + 30 + 1 + 7
50 + 1 + 30 + 7
51 + 30 + 7
51 + 37

[D] 20 + 60
20 + 60 + 3
20 + 60 + 3 + 5
20 + 3 + 60 + 5
20 + 3 + 65
23 + 65

[E] 10 + 70
10 + 70 + 2
10 + 70 + 2 + 2
10 + 2 + 70 + 2
12 + 70 + 2
12 + 72

[F] 30 + 40
30 + 40 + 6
30 + 40 + 6 + 3
30 + 6 + 40 + 3
30 + 6 + 43
36 + 43

5. Find the sums.

[A]

$$\begin{array}{r}30\\+40\\\hline\end{array}\quad\begin{array}{r}30\\6\\+40\\\hline\end{array}\quad\begin{array}{r}30\\6\\40\\+\ 3\\\hline\end{array}\quad\begin{array}{r}36\\40\\+\ 3\\\hline\end{array}\quad\begin{array}{r}36\\+43\\\hline\end{array}$$

[B]

$$\begin{array}{r}60\\+20\\\hline\end{array}\quad\begin{array}{r}60\\5\\+20\\\hline\end{array}\quad\begin{array}{r}60\\5\\20\\+\ 3\\\hline\end{array}\quad\begin{array}{r}60\\5\\+23\\\hline\end{array}\quad\begin{array}{r}65\\+23\\\hline\end{array}$$

[C]

$$\begin{array}{r}20\\+50\\\hline\end{array}\quad\begin{array}{r}20\\4\\+50\\\hline\end{array}\quad\begin{array}{r}20\\4\\50\\+\ 3\\\hline\end{array}\quad\begin{array}{r}24\\50\\+\ 3\\\hline\end{array}\quad\begin{array}{r}24\\+53\\\hline\end{array}$$

[D]

$$\begin{array}{r}40\\+40\\\hline\end{array}\quad\begin{array}{r}40\\40\\+\ 5\\\hline\end{array}\quad\begin{array}{r}40\\4\\40\\+\ 5\\\hline\end{array}\quad\begin{array}{r}40\\4\\+45\\\hline\end{array}\quad\begin{array}{r}44\\+45\\\hline\end{array}$$

6. Find the sums.

[A]

$$\begin{array}{r}80\\+10\\\hline\end{array}\quad\begin{array}{r}7\\+2\\\hline\end{array}\quad\begin{array}{r}87\\+12\\\hline\end{array}$$

[B]

$$\begin{array}{r}30\\+50\\\hline\end{array}\quad\begin{array}{r}4\\+2\\\hline\end{array}\quad\begin{array}{r}34\\+52\\\hline\end{array}$$

[C]

$$\begin{array}{r}20\\+70\\\hline\end{array}\quad\begin{array}{r}6\\+1\\\hline\end{array}\quad\begin{array}{r}26\\+71\\\hline\end{array}$$

[D]

$$\begin{array}{r}50\\+40\\\hline\end{array}\quad\begin{array}{r}2\\+7\\\hline\end{array}\quad\begin{array}{r}52\\+47\\\hline\end{array}$$

Addition exercises

1. Find the sums.

[A] 15 +42	[B] 47 +31	[C] 32 +65	[D] 41 +23	[E] 82 +14	[F] 60 +70	[G] 62 +73	[H] 70 +50
[I] 75 +53	[J] 84 +72	[K] 24 +65	[L] 95 +43	[M] 72 +72	[N] 35 +52	[O] 60 +17	[P] 60 +7
[Q] 50 +30	[R] 58 +30	[S] 40 +27	[T] 60 +78	[U] 85 +4	[V] 4 +25	[W] 43 +36	[X] 57 +22

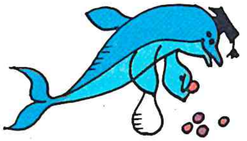
2. You add hundreds the same way you add tens. Find the sums.

[A] 236 +541	[B] 427 +370	[C] 123 +356	[D] 208 +710	[E] 827 +60
[F] 382 +413	[G] 600 +400	[H] 623 +456	[I] 735 +542	[J] 834 +652
[K] 428 +910	[L] 506 +973	[M] 614 +614	[N] 837 +242	[O] 657 +741

3. Find the sums.

[A] 23 14 +51	[B] 33 22 +11	[C] 41 26 +32
[D] 40 40 +20	[E] 70 20 +10	[F] 42 43 +24
[G] 72 24 +41	[H] 4 65 +40	[I] 23 2 +33

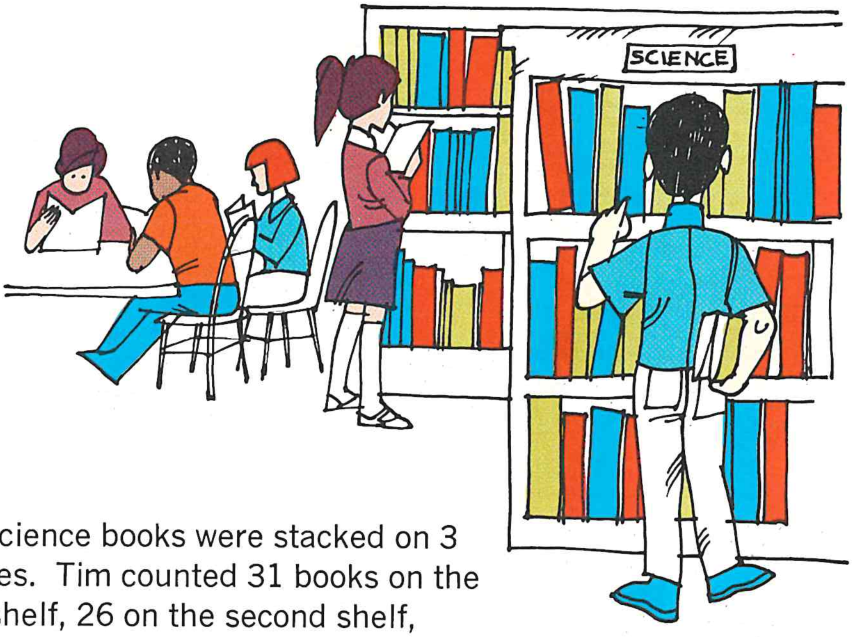
Think



Tom had 10 marbles. Bill said, "If you give me 2 of your marbles, then we'll both have the same number."

How many marbles did Bill have?

In the library



1. The science books were stacked on 3 shelves. Tim counted 31 books on the first shelf, 26 on the second shelf, and 32 on the third shelf. How many science books were there?

2. Jane checked out a book on the thirteenth day of the month. She had to return the book in 14 days. What day was Jane's book due?

3. Sue could read about 132 words each minute. About how many words could Sue read in 3 minutes?

4. Jane kept a record of the number of days it took her to read a book. How many days in all did it take for Jane to read books A, B, and C?

Books	Days
Book **A**	12
Book **B**	14
Book **C**	13

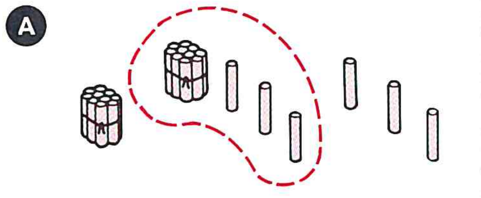
5. Tim started reading a science book on page 62. After he read 25 pages, where was he in the book?

Subtraction: 2-digit numbers

EXERCISES

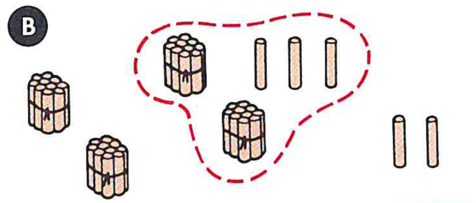
1. Box A

[**A**] How many sticks in all?
[**B**] How many sticks in the dotted ring?
[**C**] How many sticks not in the dotted ring?



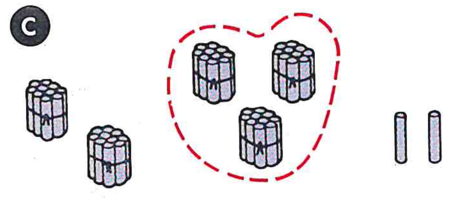
2. Box B

[**A**] How many sticks in all?
[**B**] How many sticks in the dotted ring?
[**C**] How many sticks not in the dotted ring?



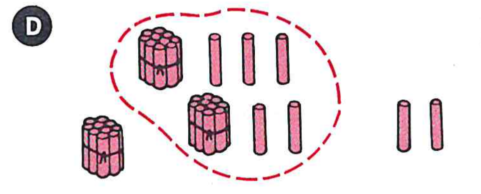
3. Box C

[**A**] How many sticks in all?
[**B**] How many sticks in the dotted ring?
[**C**] How many sticks not in the dotted ring?



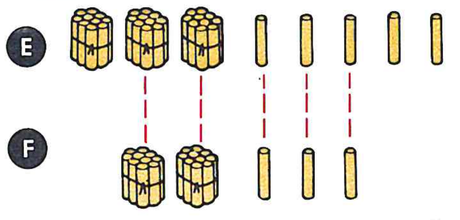
4. Box D

[**A**] How many sticks in all?
[**B**] How many sticks in the dotted ring?
[**C**] How many sticks not in the dotted ring?



5. Box E and F

[**A**] How many sticks in set E?
[**B**] How many sticks in set F?
[**C**] How many more sticks in set E than in set F?



6. Find the differences.

[**A**] Since $30 + 50 = 80$, we know that $80 - 50 = \boxed{n}$.
[**B**] Since $20 + 40 = 60$, we know that $60 - 40 = \boxed{n}$.
[**C**] Since $70 + 50 = 120$, we know that $120 - 50 = \boxed{n}$.
[**D**] Since $60 + 90 = 150$, we know that $150 - 90 = \boxed{n}$.

EXERCISES

1. Find the differences.

[A] 50 − 20
56 − 20
56 − 21

[B] 40 − 10
45 − 10
45 − 12

[C] 70 − 30
73 − 30
73 − 33

[D] 80 − 50
87 − 50
87 − 52

[E] 40 − 10
45 − 10
45 − 13

[F] 50 − 20
58 − 20
58 − 22

[G] 60 − 50
69 − 50
69 − 51

[H] 70 − 50
76 − 50
76 − 54

[I] 120 − 80
125 − 80
125 − 84

[J] 110 − 80
115 − 80
115 − 82

[K] 130 − 70
136 − 70
136 − 72

[L] 150 − 90
157 − 90
157 − 93

2. Find the differences.

[A] $\begin{array}{r} 50 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 56 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 56 \\ -21 \\ \hline \end{array}$

[B] $\begin{array}{r} 40 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 48 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 48 \\ -23 \\ \hline \end{array}$

[C] $\begin{array}{r} 60 \\ -30 \\ \hline \end{array}$ $\begin{array}{r} 67 \\ -30 \\ \hline \end{array}$ $\begin{array}{r} 67 \\ -34 \\ \hline \end{array}$

[D] $\begin{array}{r} 80 \\ -50 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ -50 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ -55 \\ \hline \end{array}$

[E] $\begin{array}{r} 90 \\ -60 \\ \hline \end{array}$ $\begin{array}{r} 97 \\ -60 \\ \hline \end{array}$ $\begin{array}{r} 97 \\ -63 \\ \hline \end{array}$

[F] $\begin{array}{r} 70 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 74 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 74 \\ -24 \\ \hline \end{array}$

[G] $\begin{array}{r} 100 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 105 \\ -20 \\ \hline \end{array}$ $\begin{array}{r} 105 \\ -21 \\ \hline \end{array}$

[H] $\begin{array}{r} 120 \\ -90 \\ \hline \end{array}$ $\begin{array}{r} 126 \\ -90 \\ \hline \end{array}$ $\begin{array}{r} 126 \\ -95 \\ \hline \end{array}$

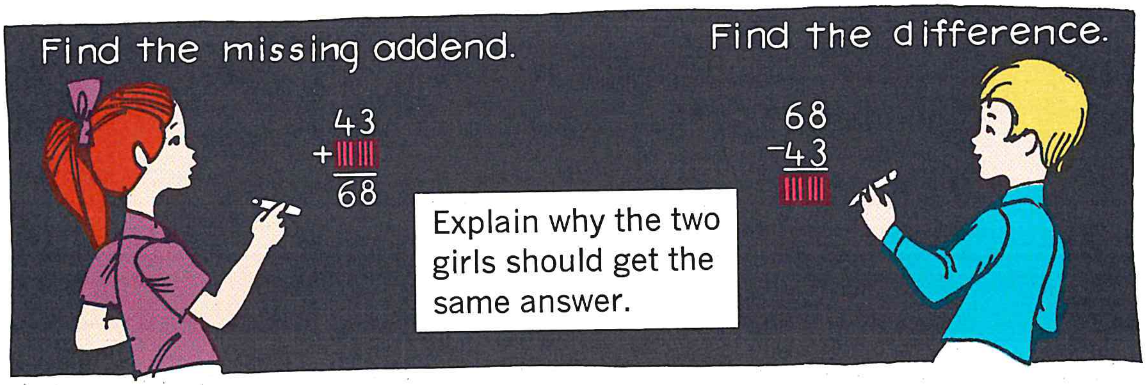
[I] $\begin{array}{r} 160 \\ -80 \\ \hline \end{array}$ $\begin{array}{r} 168 \\ -80 \\ \hline \end{array}$ $\begin{array}{r} 168 \\ -85 \\ \hline \end{array}$

[J] $\begin{array}{r} 170 \\ -90 \\ \hline \end{array}$ $\begin{array}{r} 179 \\ -90 \\ \hline \end{array}$ $\begin{array}{r} 179 \\ -95 \\ \hline \end{array}$

[K] $\begin{array}{r} 140 \\ -60 \\ \hline \end{array}$ $\begin{array}{r} 147 \\ -60 \\ \hline \end{array}$ $\begin{array}{r} 147 \\ -67 \\ \hline \end{array}$

[L] $\begin{array}{r} 130 \\ -70 \\ \hline \end{array}$ $\begin{array}{r} 136 \\ -70 \\ \hline \end{array}$ $\begin{array}{r} 136 \\ -71 \\ \hline \end{array}$

Differences and missing addends



Explain why the two girls should get the same answer.

EXERCISES

1. Copy each exercise on your paper. Then fill in the missing numbers.

[A] $\begin{array}{r} 32 \\ +\square \\ \hline 75 \end{array}$ [B] $\begin{array}{r} 43 \\ +\square \\ \hline 89 \end{array}$ [C] $\begin{array}{r} \square \\ +31 \\ \hline 47 \end{array}$ [D] $\begin{array}{r} 43 \\ +\square \\ \hline 78 \end{array}$ [E] $\begin{array}{r} 33 \\ +\square \\ \hline 79 \end{array}$ [F] $\begin{array}{r} 75 \\ +\square \\ \hline 87 \end{array}$

2. From exercise 1A, you can see that $75 - 32 = 43$.
Use exercise 1 to help you find these differences.

[A] $89 - 43$ [B] $79 - 33$ [C] $87 - 75$ [D] $78 - 43$

3. Find the differences.

[A] $23 + 35 = 58 \longrightarrow 58 - 35 = \boxed{n}$.
[B] $42 + 37 = 79 \longrightarrow 79 - 37 = \boxed{n}$.
[C] $24 + 61 = 85 \longrightarrow 85 - 61 = \boxed{n}$.
[D] $32 + 45 = 77 \longrightarrow 77 - 45 = \boxed{n}$.

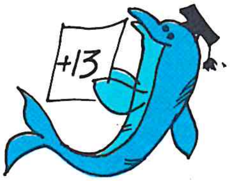
4. Find the differences.

[A] Since $65 + 21 = 86$, $\nearrow$ $86 - 21 = \boxed{n}$.
$\searrow$ $86 - 65 = \boxed{n}$.

[B] Since $34 + 25 = 59$, $\nearrow$ $59 - 25 = \boxed{n}$.
$\searrow$ $59 - 34 = \boxed{n}$.

Think

If the sum of two numbers is 70, what is the sum of these two numbers and 13?



EXERCISES

1. Find the differences.

[A] $\begin{array}{r}78\\-32\\\hline\end{array}$ [B] $\begin{array}{r}93\\-41\\\hline\end{array}$ [C] $\begin{array}{r}65\\-51\\\hline\end{array}$ [D] $\begin{array}{r}49\\-32\\\hline\end{array}$ [E] $\begin{array}{r}97\\-64\\\hline\end{array}$ [F] $\begin{array}{r}68\\-35\\\hline\end{array}$

[G] $\begin{array}{r}47\\-26\\\hline\end{array}$ [H] $\begin{array}{r}38\\-17\\\hline\end{array}$ [I] $\begin{array}{r}59\\-19\\\hline\end{array}$ [J] $\begin{array}{r}95\\-30\\\hline\end{array}$ [K] $\begin{array}{r}67\\-47\\\hline\end{array}$ [L] $\begin{array}{r}84\\-64\\\hline\end{array}$

[M] $\begin{array}{r}97\\-6\\\hline\end{array}$ [N] $\begin{array}{r}76\\-50\\\hline\end{array}$ [O] $\begin{array}{r}85\\-5\\\hline\end{array}$ [P] $\begin{array}{r}77\\-47\\\hline\end{array}$ [Q] $\begin{array}{r}87\\-43\\\hline\end{array}$ [R] $\begin{array}{r}64\\-51\\\hline\end{array}$

[S] $\begin{array}{r}100\\-90\\\hline\end{array}$ [T] $\begin{array}{r}82\\-62\\\hline\end{array}$ [U] $\begin{array}{r}126\\-74\\\hline\end{array}$ [V] $\begin{array}{r}148\\-63\\\hline\end{array}$ [W] $\begin{array}{r}125\\-34\\\hline\end{array}$ [X] $\begin{array}{r}178\\-92\\\hline\end{array}$

2. Find the differences.

[A] $\begin{array}{r}648\\-325\\\hline\end{array}$ [B] $\begin{array}{r}739\\-516\\\hline\end{array}$ [C] $\begin{array}{r}127\\-43\\\hline\end{array}$ [D] $\begin{array}{r}829\\-416\\\hline\end{array}$ [E] $\begin{array}{r}264\\-124\\\hline\end{array}$

[F] $\begin{array}{r}743\\-641\\\hline\end{array}$ [G] $\begin{array}{r}928\\-528\\\hline\end{array}$ [H] $\begin{array}{r}465\\-265\\\hline\end{array}$ [I] $\begin{array}{r}134\\-54\\\hline\end{array}$ [J] $\begin{array}{r}847\\-325\\\hline\end{array}$

[K] $\begin{array}{r}1000\\-700\\\hline\end{array}$ [L] $\begin{array}{r}1263\\-412\\\hline\end{array}$ [M] $\begin{array}{r}1475\\-624\\\hline\end{array}$ [N] $\begin{array}{r}937\\-214\\\hline\end{array}$ [O] $\begin{array}{r}657\\-642\\\hline\end{array}$

[P] $\begin{array}{r}527\\-524\\\hline\end{array}$ [Q] $\begin{array}{r}607\\-403\\\hline\end{array}$ [R] $\begin{array}{r}927\\-917\\\hline\end{array}$ [S] $\begin{array}{r}1563\\-723\\\hline\end{array}$ [T] $\begin{array}{r}1738\\-935\\\hline\end{array}$

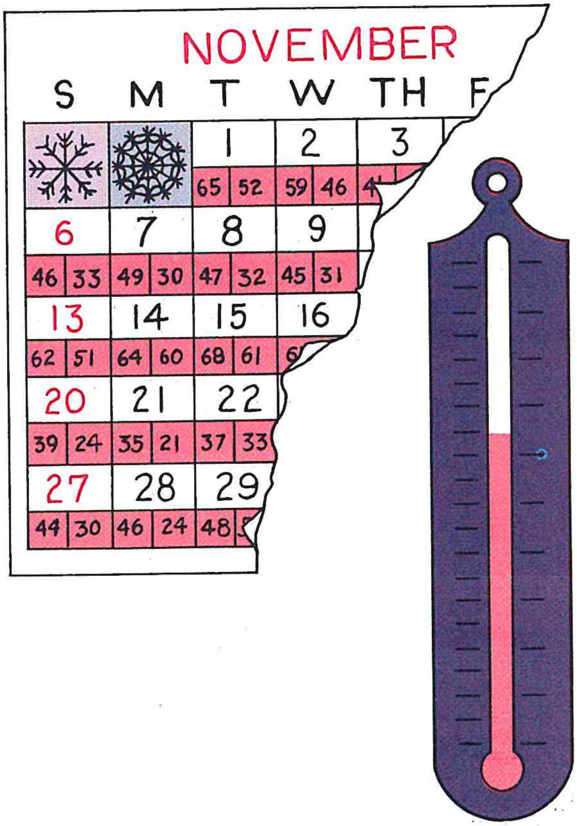
3. In each pair, how much larger is one number than the other?

[A] 65, 24
[B] 76, 89
[C] 24, 74
[D] 67, 46
[E] 57, 34
[F] 47, 43
[G] 58, 22
[H] 86, 34
[I] 280, 395
[J] 427, 627
[K] 288, 498
[L] 245, 989
[M] 9642, 9442
[N] 8765, 1234
[O] 9999, 4444
[P] 9988, 2365

Recording temperature

Miss Smith's class decided to keep a record of high and low temperatures for days in November.

For each day, the students wrote the two temperatures on the school calendar.



NOVEMBER

S	M	T	W	TH	F
		1	2	3	
		65 52	59 46	4	
6	7	8	9		
46 33	49 30	47 32	45 31		
13	14	15	16		
62 51	64 60	68 61	6		
20	21	22			
39 24	35 21	37 33			
27	28	29			
44 30	46 24	48			

EXERCISES

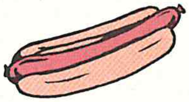
1. What was the difference between the high and the low temperature on each of these days? [A] November 8 [B] November 27 [C] November 1 [D] November 2
2. How much more was the high temperature on November 15 than the high temperature on November 6?
3. November 14 was the warmest day of the month. November 21 was the coldest. What was the difference between the high and the low temperature for November?
4. Water freezes at temperatures of 32 or lower. How many days are shown with freezing temperatures?
5. How many days are shown with temperatures above 60?
6. Which Sundays had freezing temperatures?

At the lunch counter

MENU

Sandwiches

Cheese	25
Ham	30
Peanut butter	20
Hamburger	30
Hot dog	20
Tuna	25
Beef	35



Soups

Chili	30
Vegetable	25
Bean	20

Beverages

Milk	12
Milk shake	25
Root beer	10
Orange	10
Coffee	10
Tea	10

Desserts

Ice cream	15
Cake	20
Pie	20

EXERCISES

1. What costs the most on the menu?

2. Which soup is the least expensive?

3. How much more is cake than ice cream?

4. How much less is milk than a milk shake?

5. How much more is a beef sandwich than a tuna sandwich?

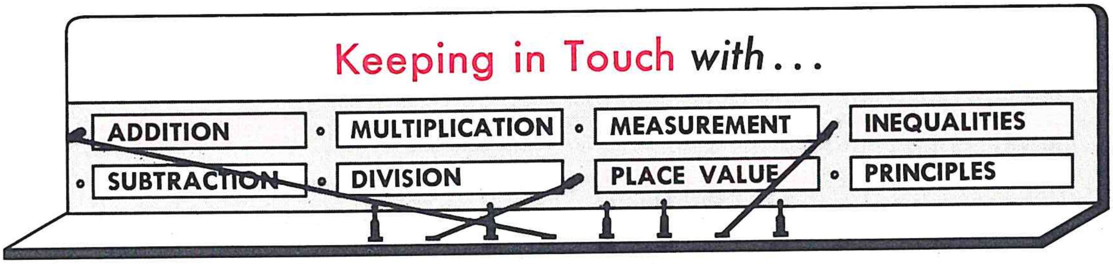
6. For lunch, Sue had a hot dog, vegetable soup, and a root beer. How much did her lunch cost?

7. Bill spent 77 cents for his lunch. What did Bill have to drink?

★ **8.** Ann had 75 cents to spend for lunch. She spent more than 65 cents. What might Ann have ordered?

★ **9.** Tom did not like soup or dessert. He spent 75 cents for lunch. What might Tom have ordered if he had only one beverage?

★ **10.** Jean had one soup, one beverage, and one dessert. She spent 65 cents. What did she have to drink?

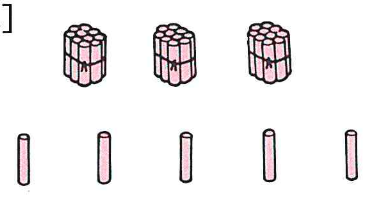


1. Solve the equations.

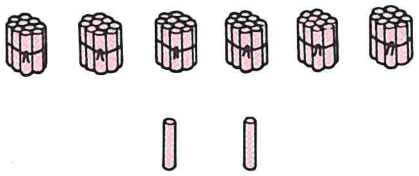
[A] $38 = 30 + \boxed{n}$
[B] $56 = 50 + \boxed{n}$
[C] $70 + 2 = \boxed{n}$
[D] $80 + 3 = \boxed{n}$
[E] $358 = 300 + 50 + \boxed{n}$
[F] $463 = 400 + 60 + \boxed{n}$
[G] $781 = 700 + 80 + \boxed{n}$
[H] $640 = 600 + 40 + \boxed{n}$

2. Give the number of each set.

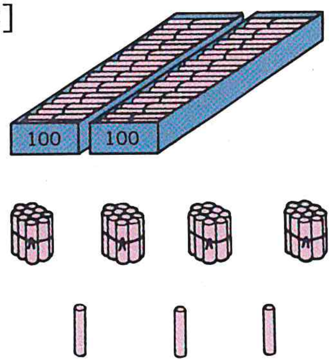
[A]



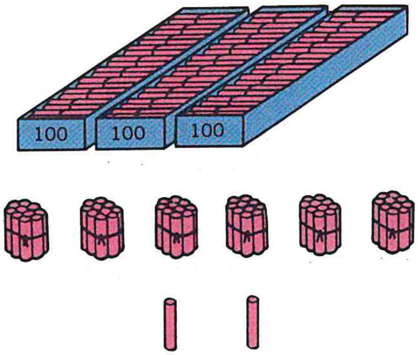
[B]



[C]



[D]



3. Solve the equations.

[A] $76 = 70 + \boxed{n}$
[B] $76 = 60 + \boxed{n}$
[C] $42 = 40 + \boxed{n}$
[D] $42 = 30 + \boxed{n}$
[E] $91 = 90 + \boxed{n}$
[F] $91 = 80 + \boxed{n}$
[G] $50 = 50 + \boxed{n}$
[H] $50 = 40 + \boxed{n}$
[I] $62 = 60 + \boxed{n}$
[J] $62 = 50 + \boxed{n}$
[K] $24 = 20 + \boxed{n}$
[L] $24 = 10 + \boxed{n}$

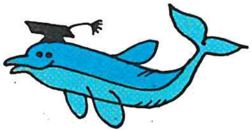
4. Write each number pair on your paper. Then put the correct mark in place of the ▥. Write the two numbers in the order given.

[A] 65 ▥ 13
(Answer: 65 > 13)
[B] 27 ▥ 95
(Answer: 27 < 95)
[C] 38 ▥ 48
[D] 29 ▥ 30
[E] 40 ▥ 10
[F] 55 ▥ 56
[G] 97 ▥ 47
[H] 100 ▥ 99
[I] 23 ▥ 32

[J] 124 ▥ 134
[K] 615 ▥ 605
[L] 82 ▥ 92
[M] 75 ▥ 175
[N] 26 ▥ 20
[O] 45 ▥ 54
[P] 69 ▥ 68
[Q] 69 ▥ 70
[R] 743 ▥ 733
[S] 657 ▥ 756
[T] 329 ▥ 239

Think

The sum of two numbers is 20. Their difference is 4. What are the numbers?



5. Give the correct mark for each ▥.

[A] Since 7 + 5 > 10, we know that 67 + 5 ▥ 70.
[B] Since 5 + 4 < 10, we know that 15 + 4 ▥ 20.
[C] Since 8 + 6 > 10, we know that 48 + 6 ▥ 50.
[D] Since 8 + 4 > 10, we know that 48 + 4 ▥ 50.
[E] Since 4 + 5 < 10, we know that 24 + 25 ▥ 50.

6. Tell whether each sum is less than 50, more than 50, or equal to 50.

[A] 46 + 3
[B] 46 + 4
[C] 46 + 5
[D] 46 + 6

[E] 47 + 1
[F] 47 + 2
[G] 47 + 3
[H] 47 + 4

7. Tell whether each sum is less than, more than, or equal to 70.

[A] 68 + 4
[B] 62 + 5
[C] 69 + 1
[D] 68 + 1

[E] 67 + 5
[F] 63 + 6
[G] 64 + 6
[H] 64 + 7

8. Give the sum for each part of exercises 6 and 7.

9. Find the sums.

[A] $\begin{array}{r} 24 \\ +4 \\ \hline \end{array}$ [B] $\begin{array}{r} 24 \\ +5 \\ \hline \end{array}$ [C] $\begin{array}{r} 24 \\ +6 \\ \hline \end{array}$

[D] $\begin{array}{r} 24 \\ +7 \\ \hline \end{array}$ [E] $\begin{array}{r} 24 \\ +8 \\ \hline \end{array}$ [F] $\begin{array}{r} 24 \\ +18 \\ \hline \end{array}$

[G] $\begin{array}{r} 24 \\ +28 \\ \hline \end{array}$ [H] $\begin{array}{r} 54 \\ +38 \\ \hline \end{array}$ [I] $\begin{array}{r} 54 \\ +58 \\ \hline \end{array}$

Sums: 2-digit numbers

Method A

Step 1

$$\begin{array}{r} 37 \\ +25 \\ \hline 12 \end{array}$$

$7 + 5 = 12$

Step 2

$$\begin{array}{r} 37 \\ +25 \\ \hline 12 \\ 50 \\ \hline \end{array}$$

$30 + 20 = 50$

Step 3

$$\begin{array}{r} 37 \\ +25 \\ \hline 12 \\ 50 \\ \hline 62 \end{array}$$

$12 + 50 = 62$

Here are some examples using method A. One example has a mistake. See if you can find it.

$$\begin{array}{r} 47 \\ +34 \\ \hline 11 \\ 70 \\ \hline 81 \end{array} \qquad \begin{array}{r} 65 \\ +28 \\ \hline 13 \\ 80 \\ \hline 93 \end{array} \qquad \begin{array}{r} 36 \\ +59 \\ \hline 14 \\ 80 \\ \hline 94 \end{array}$$

Method B

Step 1

$$\begin{array}{r} \overset{1}{3}7 \\ +25 \\ \hline 2 \end{array}$$

$7 + 5 = 12$

Step 2

$$\begin{array}{r} \overset{1}{3}7 \\ +25 \\ \hline 62 \end{array}$$

$10 + 30 + 20 = 60$

Here are some examples using method B. One example has a mistake. See if you can find it.

$$\begin{array}{r} \overset{1}{4}5 \\ +38 \\ \hline 83 \end{array} \qquad \begin{array}{r} \overset{1}{3}4 \\ +48 \\ \hline 72 \end{array} \qquad \begin{array}{r} \overset{1}{2}9 \\ +16 \\ \hline 45 \end{array}$$

EXERCISES

1. Find these sums, using method A.

[A] 46 +28
[B] 37 +44
[C] 29 +65
[D] 67 +15
[E] 48 +6
[F] 34 +27
[G] 68 +19
[H] 17 +35
[I] 54 +9
[J] 37 +27

2. Now do each part of exercise 1 again, using method B.

3. Find the sums.

[A] 57 +85
[B] 48 +72
[C] 89 +33
[D] 58 +77
[E] 69 +44
[F] 96 +44
[G] 85 +77
[H] 98 +33
[I] 84 +27
[J] 75 +58

4. Find the sums.

[A] 57 +35
[B] 57 +45
[C] 67 +45
[D] 167 +45
[E] 187 +45

5. Find the sums.

[A] 68 +7
[B] 68 +57
[C] 168 +57
[D] 368 +57
[E] 368 +457

6. Find the sums.

[A] 258 +137
[B] 258 +167
[C] 258 +187
[D] 546 +125
[E] 546 +175
[F] 546 +675
[G] 804 +307
[H] 906 +218
[I] 937 +105

Think

I can be found
Halfway between
Twenty-seven
And seventeen.

WHO AM I?

Getting weighed

Weight Chart	
Bobby	65
Susan	58
Tom	55
Sara	47
Alan	49
Bill	63
Jane	52
Tony	56
Joan	51
Ann	48
Rick	67

EXERCISES

1. Which child weighs most?

2. Who weighs least?

3. How many children weigh less than 50 pounds?

4. How many children weigh more than 60 pounds?

5. The boys' names are in the red boxes. Who is the lightest boy?

6. Who is the heaviest girl?

7. How much do these children weigh together?

[A] Bobby and Alan
[B] Susan and Sara
[C] Rick and Tony
[D] Ann and Joan
[E] Sara and Ann
[F] Bill and Alan

★ **8.** Two children got on the scales together. The scales showed 132. Who were the children?

Reading in subtraction

Because we know

$14 - 8 = 6,$

→

we see that

$24 - 8 = 16.$

EXERCISES

1. Find the differences.

[A] $\begin{array}{rrrrr} 12 & 22 & 32 & 42 & 52 \\ -5 & -5 & -5 & -5 & -5 \\ \hline \end{array}$

[B] $\begin{array}{rrrrr} 14 & 24 & 34 & 44 & 54 \\ -6 & -6 & -6 & -6 & -6 \\ \hline \end{array}$

[C] $\begin{array}{rrrrr} 13 & 23 & 33 & 43 & 53 \\ -4 & -4 & -4 & -4 & -4 \\ \hline \end{array}$

[D] $\begin{array}{rrrrr} 15 & 25 & 35 & 45 & 55 \\ -7 & -7 & -7 & -7 & -7 \\ \hline \end{array}$

2. Find the differences.

[A] $\begin{array}{rrrrr} 12 & 22 & 32 & 32 & 32 \\ -4 & -4 & -4 & -14 & -24 \\ \hline \end{array}$

[B] $\begin{array}{rrrrr} 13 & 23 & 33 & 33 & 33 \\ -5 & -5 & -5 & -15 & -25 \\ \hline \end{array}$

[C] $\begin{array}{rrrrr} 14 & 24 & 34 & 34 & 34 \\ -7 & -7 & -7 & -17 & -27 \\ \hline \end{array}$

[D] $\begin{array}{rrrrr} 15 & 25 & 35 & 35 & 35 \\ -6 & -6 & -6 & -16 & -26 \\ \hline \end{array}$

3. Find the differences.

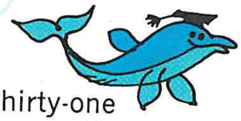
[A] $\begin{array}{rrrrr} 25 & 25 & 25 & 25 & 25 \\ -3 & -4 & -5 & -6 & -7 \\ \hline \end{array}$

[B] $\begin{array}{rrrrr} 34 & 34 & 34 & 34 & 34 \\ -3 & -4 & -5 & -6 & -7 \\ \hline \end{array}$

[C] $\begin{array}{rrrrr} 53 & 53 & 53 & 53 & 53 \\ -2 & -3 & -4 & -5 & -15 \\ \hline \end{array}$

[D] $\begin{array}{rrrrr} 72 & 72 & 72 & 72 & 72 \\ -2 & -3 & -4 & -14 & -24 \\ \hline \end{array}$

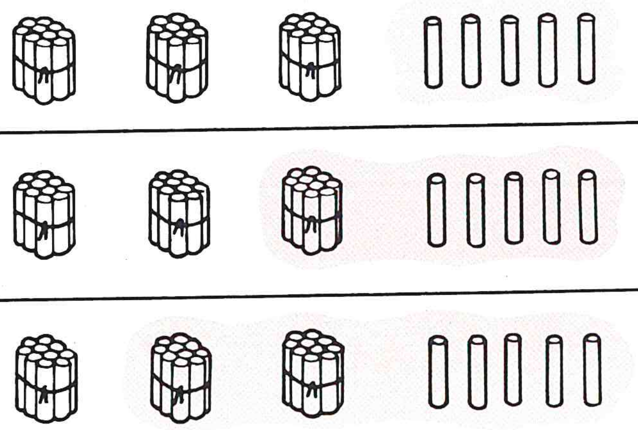
Think



Number thirty-one
Is slightly more than me.
I'm that much larger
Than number twenty-three.

WHO AM I?

Place value



35 = 30 + 5

35 = 20 + 15

35 = 10 + 25

EXERCISES

1. Find the missing numbers.

[A] 48 = 40 + n
48 = 30 + n

[B] 72 = 70 + n
72 = 60 + n

[C] 65 = 60 + n
65 = 50 + n

[D] 45 = 40 + n
45 = 30 + n

[E] 54 = 50 + n
54 = 40 + n

[F] 61 = 60 + n
61 = 50 + n

[G] 42 = 40 + n
42 = n + 12

[H] 99 = 90 + n
99 = n + 19

[I] 68 = n + 8
68 = 50 + n

2. Complete each exercise as in the examples.

Ⓐ To think of 52 as 40 + 12,
we can write $\overset{4}{\cancel{5}}{}^{1}2$.

Ⓑ To think of 37 as 20 + 17,
we can write $\overset{2}{\cancel{3}}{}^{1}7$.

[A] To think of 48 as 30 + 18,
we can write ▨.

[B] To think of 72 as 60 + 12,
we can write ▨.

[C] To think of 65 as 50 + 15,
we can write ▨.

[D] To think of 49 as 30 + 19,
we can write ▨.

Subtraction: 2-digit numbers

Step 1	Step 2	Step 3	Step 4
$\begin{array}{r} 64 \\ -26 \\ \hline \end{array}$	$\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}4 \\ -26 \\ \hline \end{array}$	$\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}4 \\ -26 \\ \hline 8 \end{array}$	$\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}4 \\ -26 \\ \hline 38 \end{array}$
$4 - 6 =$!!!	$64 = 50 + 14$	$14 - 6 = 8$	$50 - 20 = 30$

DISCUSSION EXERCISES

Explain the steps
for these examples.

$\begin{array}{r} \overset{6}{\cancel{7}}\,{}^{1}4 \\ -28 \\ \hline 46 \end{array}$ $\qquad$ $\begin{array}{r} \overset{5}{\cancel{6}}\,{}^{1}3 \\ -44 \\ \hline 19 \end{array}$ $\qquad$ $\begin{array}{r} \overset{4}{\cancel{5}}\,{}^{1}2 \\ -17 \\ \hline 35 \end{array}$ $\qquad$ $\begin{array}{r} \overset{7}{\cancel{8}}\,{}^{1}5 \\ -37 \\ \hline 48 \end{array}$

EXERCISES

1. Cover the answers and work the problems, using the short cut.

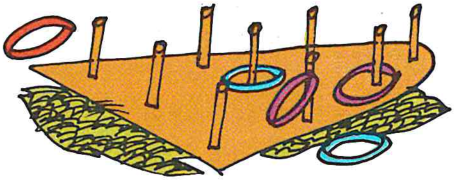
[A] $\begin{array}{r} 74 \\ -26 \\ \hline 48 \end{array}$	[B] $\begin{array}{r} 52 \\ -35 \\ \hline 17 \end{array}$	[C] $\begin{array}{r} 92 \\ -64 \\ \hline 28 \end{array}$	[D] $\begin{array}{r} 83 \\ -27 \\ \hline 56 \end{array}$	[E] $\begin{array}{r} 61 \\ -25 \\ \hline 36 \end{array}$

2. Check each answer in exercise 1 by addition.

3. Find the differences.

[A] $\begin{array}{r} 43 \\ -16 \\ \hline \end{array}$	[B] $\begin{array}{r} 33 \\ -15 \\ \hline \end{array}$	[C] $\begin{array}{r} 72 \\ -44 \\ \hline \end{array}$	[D] $\begin{array}{r} 54 \\ -17 \\ \hline \end{array}$	[E] $\begin{array}{r} 81 \\ -23 \\ \hline \end{array}$
[F] $\begin{array}{r} 68 \\ -25 \\ \hline \end{array}$	[G] $\begin{array}{r} 42 \\ -19 \\ \hline \end{array}$	[H] $\begin{array}{r} 95 \\ -77 \\ \hline \end{array}$	[I] $\begin{array}{r} 76 \\ -38 \\ \hline \end{array}$	[J] $\begin{array}{r} 69 \\ -62 \\ \hline \end{array}$
[K] $\begin{array}{r} 27 \\ -17 \\ \hline \end{array}$	[L] $\begin{array}{r} 27 \\ -18 \\ \hline \end{array}$	[M] $\begin{array}{r} 42 \\ -38 \\ \hline \end{array}$	[N] $\begin{array}{r} 57 \\ -18 \\ \hline \end{array}$	[O] $\begin{array}{r} 68 \\ -29 \\ \hline \end{array}$
[P] $\begin{array}{r} 90 \\ -34 \\ \hline \end{array}$	[Q] $\begin{array}{r} 84 \\ -9 \\ \hline \end{array}$	[R] $\begin{array}{r} 60 \\ -23 \\ \hline \end{array}$	[S] $\begin{array}{r} 51 \\ -16 \\ \hline \end{array}$	[T] $\begin{array}{r} 43 \\ -38 \\ \hline \end{array}$
[U] $\begin{array}{r} 50 \\ -16 \\ \hline \end{array}$	[V] $\begin{array}{r} 80 \\ -47 \\ \hline \end{array}$	[W] $\begin{array}{r} 67 \\ -30 \\ \hline \end{array}$	[X] $\begin{array}{r} 52 \\ -8 \\ \hline \end{array}$	[Y] $\begin{array}{r} 63 \\ -36 \\ \hline \end{array}$

Reading a chart



The numbers given in the chart are the children's scores for each game. For example, Dan scored 47 points in game 3.

Game 6	31	71	42	54	34	36
Game 5	63	18	43	64	29	67
Game 4	50	76	40	56	67	58
Game 3	39	43	72	47	34	52
Game 2	34	26	58	27	54	23
Game 1	28	27	62	81	60	47
	Ann	Bill	Carol	Dan	Ed	Fay

1. [**A**] What did Bill score in game 5?
[**B**] What did Fay score in game 5?
[**C**] What did Dan score in game 6?
[**D**] What did Carol score in game 1?
[**E**] What did Ann score in game 2?
[**F**] What did Ed score in game 4?
[**G**] What did Ed score in game 3?
[**H**] What did Carol score in game 3?

2. [**A**] Who had the highest score in game 5?
[**B**] Who had the lowest score in game 1?
[**C**] In which game did Bill have his highest score?
[**D**] In which game did Ed have his lowest score?

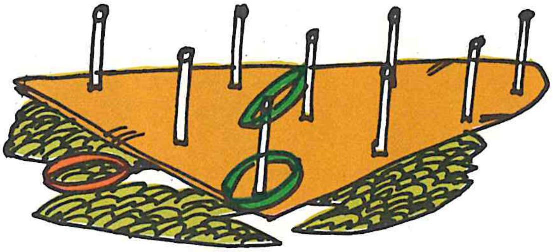
3. [**A**] Who had a score of 29? [**B**] In which game was this scored?

4. Give the child's name and the game number for these scores.
[**A**] 40 [**B**] 31 [**C**] 52 [**D**] 60 [**E**] 23

5. [**A**] In which game was the lowest score made? [**B**] Who had this score?

6. [**A**] Who had the highest score? [**B**] In which game was this scored?

Figuring scores



1. How many points did Fay score in games 2 and 3 together?

2. How many more points did Bill score in game 4 than in game 3?

3. [A] What was the highest score in game 6?
   [B] What was the lowest score in game 6?
   [C] In game 6, how much more was the highest score than the lowest score?

4. In game 2, how many points did Carol and Dan score together?

5. In game 5, how much less was Ed's score than Dan's?

6. Fay found the sum of her two best scores. Was this more or less than the sum of Ed's two best scores?

7. In game 1, the sum of the two highest scores was 143. In what other game was the sum of the two highest scores 143?

8. What is the difference of the highest score on the chart and the lowest score?

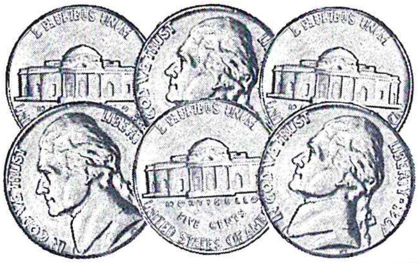
★ 9. The children decided that the winner should be the one who had the highest sum for his best 3 games. Who won?

★ 10. In which game were the most points scored?

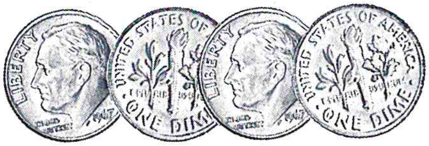
Value of coin collections

Penny	Nickel	Dime	Quarter	Half Dollar
1 cent	5 cents	10 cents	25 cents	50 cents

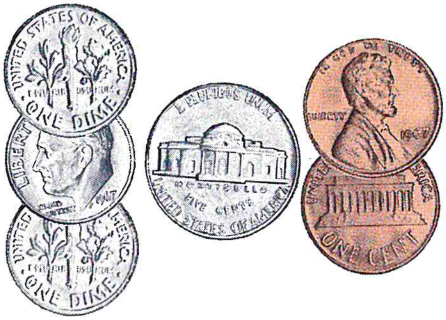
A



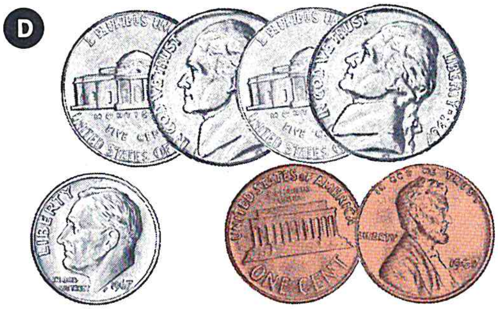
B



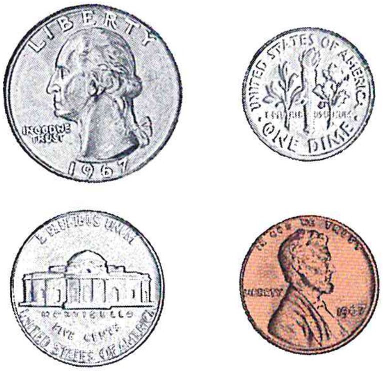
C



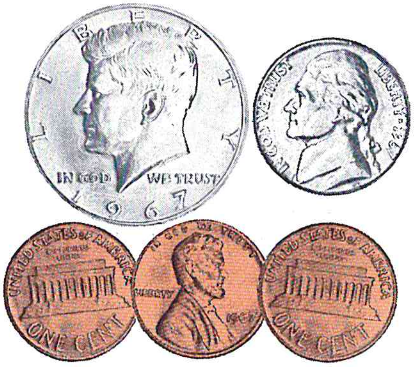
D



E



F



EXERCISES

1. Give the value of each coin collection in the table on page 76.

2. For each part, tell which coin collection has the greater value.

   [A] B or C
   [B] A or B
   [C] A or D
   [D] B or E
   [E] C or D
   [F] C or E
   [G] C or F
   [H] E or F

3. Give the value of each of the two coin collections together.

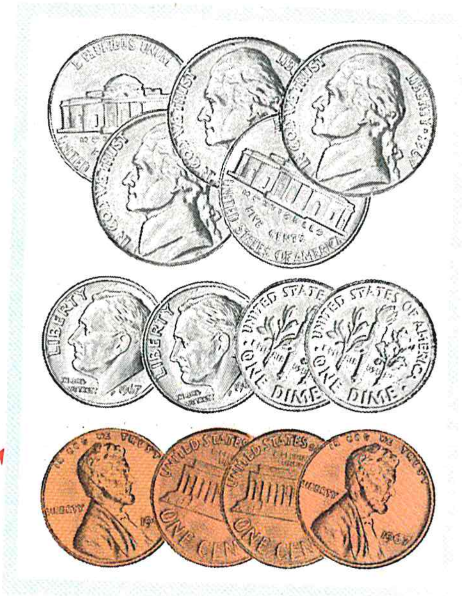
   [A] A and B
   [B] B and D
   [C] A and C
   [D] B and C
   [E] D and E
   [F] A and D
   [G] C and D
   [H] A and E
   [I] B and F
   [J] E and F
   [K] D and F
   [L] C and F

4. [A] How much more is B than A?
   [B] How much more is D than A?
   [C] How much more is C than D?
   [D] How much more is E than B?
   [E] How much more is C than A?
   [F] How much more is E than A?
   [G] How much more is F than A?
   [H] How much more is F than B?
   [I] How much more is E than C?
   [J] How much more is F than C?
   [K] How much more is F than D?
   [L] How much more is E than D?

5. Which pair of collections has the greater value?

   [A] A and B together or C and D together
   [B] A and C together or B and D together
   [C] A and B together or A and C together
   [D] A and B together or A and E together
   [E] C and E together or F and A together
   [F] C and B together or E and D together

★ 6. Two of the sets on page 76 would look like this if you put them together. Which two sets are they?



Working with dollars and cents

1. Give the missing numbers.

Example: $5.28 means 5 dollars and 28 cents.

[A] $7.16 means |||||| dollars and 16 cents.
[B] $4.75 means 4 dollars and |||||| cents.
[C] $2.09 means |||||| dollars and 9 cents.
[D] $17.34 means |||||| dollars and |||||| cents.
[E] $6.05 means |||||| dollars and |||||| cents.

2. Give the missing numbers.

Example: $4.38 is 438 cents.

[A] $6.52 is |||||| cents.
[B] $1.27 is |||||| cents.
[C] $6.09 is |||||| cents.
[D] $1.00 is |||||| cents.
[E] $.76 is |||||| cents.
[F] $3.98 is |||||| cents.
[G] $.50 is |||||| cents.
[H] $2.86 is |||||| cents.
[I] $4.75 is |||||| cents.

3. Find the total amounts.

Examples: $1.23 and $2.45 is $3.68.
$2.45 and $3.72 is $6.17.

[A] $2.14 and $1.53 is ||||||.
[B] $5.21 and $2.37 is ||||||.
[C] $3.50 and $3.50 is ||||||.
[D] $3.60 and $3.60 is ||||||.
[E] $4.75 and $2.61 is ||||||.
[F] $1.79 and $3.65 is ||||||.

4. Find the total amounts.

Example:
$5.68
2.71
$8.39

[A] $3.27
4.61

[B] $5.38
1.25

[C] $7.64
1.75

[D] $2.76
1.85

[E] $3.79
4.48

[F] $9.72
8.99

5. Find the difference in the amounts.

Example:
$5.27
1.43
$3.84

[A] $6.34
1.52

[B] $7.65
2.24

[C] $8.32
4.18

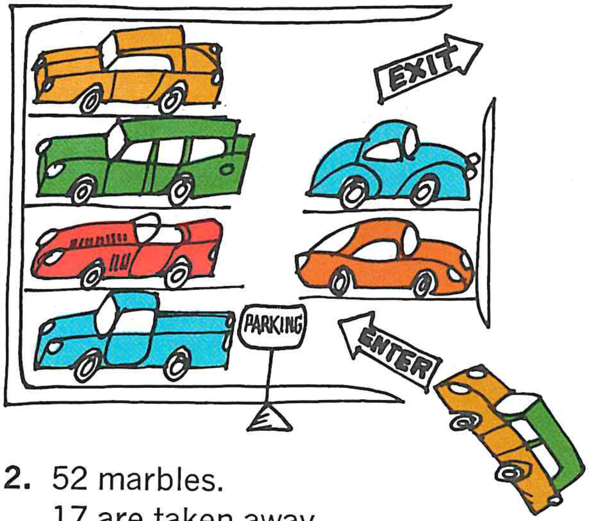
[D] $9.21
1.65

[E] $12.72
5.28

[F] $10.64
3.95

Short stories

1. In the picture, how many more cars are there than parking spaces?



2. 52 marbles.
17 are taken away.
How many are left?

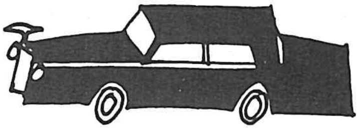
3. 43 cookies.
28 ice cream bars.
How many more cookies than ice cream bars?

4. 84 cents for a game. 56 cents for a puzzle. How much less for the puzzle than for the game?

5. 14 apples in a sack.
More are put in.
32 apples in the sack now.
How many were put in?

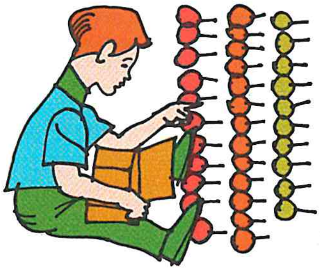
6. Room A: 32 children.
Room B: 27 children.
How many more in room A than in B? How many less in room B than in A?

7. 65 cars. 19 are black.
How many are not black?

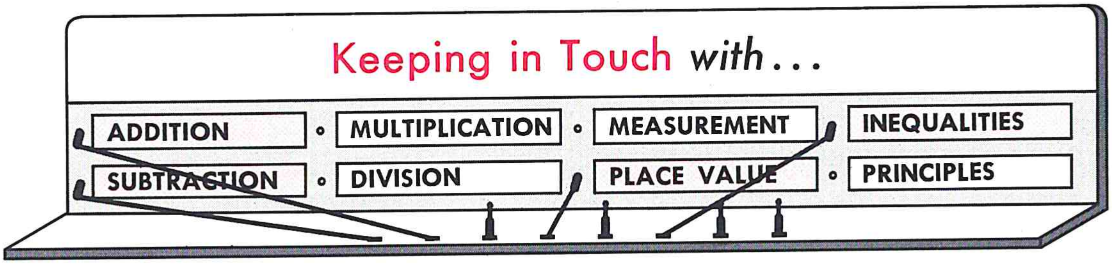


8. 60 eggs.
One dozen are broken.
How many are not broken?

9. 45 doughnuts.
27 of them are eaten.
How many are left?



★ 10. 25 children.
34 lollipops.
Each child gets at least one lollipop. How many children can have two?



1. Four of these statements are false. Which ones are they?

[A] $15 - 5 = 5$
[B] $26 + 7 > 30$
[C] $34 - 8 > 30$
[D] $39{,}427 > 38{,}998$
[E] $48 - 9 < 40$
[F] $48 - 19 > 30$
[G] $67 + 8 = 70 + 5$
[H] $48{,}265 = 48{,}165 + 1000$
[I] $528 = 500 + 20 + 8$

2. Write the correct numeral for each ▥.

[A] For 6 tens and 2, we write ▥.
[B] For 8 tens and 7, we write ▥.
[C] For 2 tens and 5, we write ▥.
[D] For 5 tens and 2, we write ▥.
[E] For 7 tens and 0, we write ▥.
[F] For 1 ten and 0, we write ▥.

3. Solve the equations.

[A] $6 + 5 = \boxed{n}$
[B] $4 + 3 = \boxed{n}$
[C] $8 + 7 = \boxed{n}$
[D] $9 + 2 = \boxed{n}$
[E] $6 + 4 = \boxed{n}$
[F] $8 + 8 = \boxed{n}$
[G] $\boxed{n} + 6 = 8$
[H] $\boxed{n} + 4 = 11$
[I] $\boxed{n} + 9 = 10$
[J] $\boxed{n} + 8 = 12$
[K] $\boxed{n} + 6 = 6$
[L] $\boxed{n} + 5 = 10$
[M] $14 - 5 = \boxed{n}$
[N] $9 - 6 = \boxed{n}$
[O] $12 - 5 = \boxed{n}$
[P] $11 - 4 = \boxed{n}$
[Q] $15 - 7 = \boxed{n}$
[R] $18 - 9 = \boxed{n}$
[S] $\boxed{n} + 6 = 8$
[T] $4 + \boxed{n} = 9$
[U] $6 + 8 = \boxed{n}$
[V] $\boxed{n} - 2 = 5$
[W] $9 - \boxed{n} = 4$
[X] $15 - 5 = \boxed{n}$

4. Find the sums and differences.

[A] $\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$ [B] $\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$ [C] $\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$ [D] $\begin{array}{r} 12 \\ -4 \\ \hline \end{array}$ [E] $\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$ [F] $\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$ [G] $\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$ [H] $\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$

[I] $\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$ [J] $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ [K] $\begin{array}{r} 10 \\ -8 \\ \hline \end{array}$ [L] $\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$ [M] $\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$ [N] $\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$ [O] $\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$ [P] $\begin{array}{r} 12 \\ -9 \\ \hline \end{array}$

[Q] $\begin{array}{r} 5 \\ +8 \\ \hline \end{array}$ [R] $\begin{array}{r} 14 \\ -5 \\ \hline \end{array}$ [S] $\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$ [T] $\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$ [U] $\begin{array}{r} 14 \\ -6 \\ \hline \end{array}$ [V] $\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$ [W] $\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$ [X] $\begin{array}{r} 9 \\ +4 \\ \hline \end{array}$

5. Copy each column and complete the counting.

[A]	[B]	[C]	[D]	[E]
6	16	86	96	436
7	17	87	97	437
8	18	88	98	438
▥	▥	89	▥	439
▥	▥	▥	▥	▥
▥	▥	▥	▥	▥
▥	22	▥	▥	▥

6. Solve each equation.

[A] $9 + 1 = \boxed{n}$ [B] $99 + 1 = \boxed{n}$ [C] $999 + 1 = \boxed{n}$ [D] $9999 + 1 = \boxed{n}$

7. Give the correct sign $<$ or $>$ for each ◍.

[A] 26 ◍ 28
[B] 94 ◍ 90
[C] 87 ◍ 77
[D] 59 ◍ 99
[E] 127 ◍ 147
[F] 238 ◍ 228
[G] 654 ◍ 664
[H] 275 ◍ 272
[I] 542 ◍ 546
[J] 556 ◍ 561
[K] 672 ◍ 658
[L] 180 ◍ 159
[M] 338 ◍ 242
[N] 665 ◍ 571
[O] 862 ◍ 955

8. Copy the problems and give the missing digits.

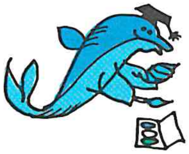
[A] $\begin{array}{r} 1\square \\ -6 \\ \hline 11 \end{array}$ [B] $\begin{array}{r} 26 \\ +\square \\ \hline 34 \end{array}$ [C] $\begin{array}{r} \square 6 \\ +19 \\ \hline 4\square \end{array}$

[D] $\begin{array}{r} 6\square \\ +\square 7 \\ \hline 91 \end{array}$ [E] $\begin{array}{r} \square\square \\ -47 \\ \hline 16 \end{array}$ [F] $\begin{array}{r} 72 \\ -3\square \\ \hline \square 8 \end{array}$

[G] $\begin{array}{r} 43\square \\ +2\square 3 \\ \hline \square 98 \end{array}$ [H] $\begin{array}{r} 48\square \\ +\square 54 \\ \hline 9\square 3 \end{array}$ [I] $\begin{array}{r} 87\square \\ -\square 63 \\ \hline 6\square 5 \end{array}$

[J] $\begin{array}{r} 663 \\ -\square 47 \\ \hline 4\square\square \end{array}$ [K] $\begin{array}{r} 934 \\ -57\square \\ \hline \square\square 8 \end{array}$ [L] $\begin{array}{r} 538 \\ +\square 6\square \\ \hline 9\square 5 \end{array}$

Think



Nan picked out 5 white shells. She put some blue paint on 3 of them. Then she could see white on only 3 of the 5 shells. On how many could she see both blue and white?

Chapter review

1. Find the sums and differences.

[A] $\begin{array}{r}23\\+51\\\hline\end{array}$ [B] $\begin{array}{r}78\\-24\\\hline\end{array}$ [C] $\begin{array}{r}56\\+13\\\hline\end{array}$ [D] $\begin{array}{r}60\\+16\\\hline\end{array}$ [E] $\begin{array}{r}57\\-36\\\hline\end{array}$ [F] $\begin{array}{r}82\\-32\\\hline\end{array}$

[G] $\begin{array}{r}27\\+54\\\hline\end{array}$ [H] $\begin{array}{r}62\\-24\\\hline\end{array}$ [I] $\begin{array}{r}48\\+36\\\hline\end{array}$ [J] $\begin{array}{r}75\\+15\\\hline\end{array}$ [K] $\begin{array}{r}43\\-15\\\hline\end{array}$ [L] $\begin{array}{r}51\\-27\\\hline\end{array}$

[M] $\begin{array}{r}67\\+27\\\hline\end{array}$ [N] $\begin{array}{r}86\\-67\\\hline\end{array}$ [O] $\begin{array}{r}70\\-26\\\hline\end{array}$ [P] $\begin{array}{r}38\\+57\\\hline\end{array}$ [Q] $\begin{array}{r}79\\+48\\\hline\end{array}$ [R] $\begin{array}{r}123\\-44\\\hline\end{array}$

2. Find the sums.

[A] $\begin{array}{r}23\\16\\+50\\\hline\end{array}$ [B] $\begin{array}{r}31\\26\\+12\\\hline\end{array}$ [C] $\begin{array}{r}42\\14\\+20\\\hline\end{array}$ [D] $\begin{array}{r}30\\50\\+20\\\hline\end{array}$ [E] $\begin{array}{r}32\\50\\+26\\\hline\end{array}$ [F] $\begin{array}{r}32\\24\\+10\\\hline\end{array}$

[G] $\begin{array}{r}36\\47\\+10\\\hline\end{array}$ [H] $\begin{array}{r}26\\38\\+12\\\hline\end{array}$ [I] $\begin{array}{r}57\\33\\+19\\\hline\end{array}$ [J] $\begin{array}{r}28\\39\\+17\\\hline\end{array}$ [K] $\begin{array}{r}56\\78\\+89\\\hline\end{array}$ [L] $\begin{array}{r}78\\25\\+96\\\hline\end{array}$

3. Find the differences.

[A] $\begin{array}{r}326\\-114\\\hline\end{array}$ [B] $\begin{array}{r}9782\\-1542\\\hline\end{array}$

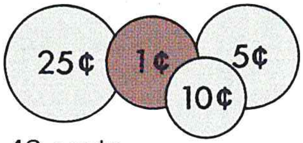
[C] $\begin{array}{r}3641\\-1216\\\hline\end{array}$ [D] $\begin{array}{r}4372\\-144\\\hline\end{array}$

★ **4.** Find the differences.

[A] $\begin{array}{r}1682\\-427\\\hline\end{array}$ [B] $\begin{array}{r}4728\\-1452\\\hline\end{array}$

[C] $\begin{array}{r}3706\\-524\\\hline\end{array}$ [D] $\begin{array}{r}8002\\-643\\\hline\end{array}$

Think

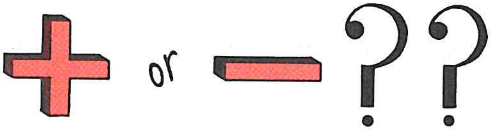


Diane has 48 cents.

1. What coins does she have if she has 9 coins?
2. What is the fewest number of coins she could have?
3. What is the fewest number of coins she could have and still have at least one of each coin pictured?

ADD OR SUBTRACT?

In these exercises no numbers are given. You should decide whether you would add or subtract if numbers were given.



EXERCISES

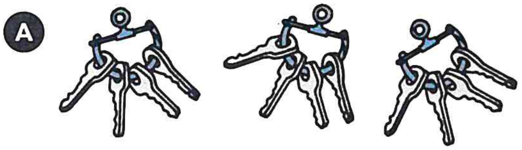
Answer *A* if you would **add** to answer the question. Answer *S* if you would **subtract.** Think carefully before giving your answer.

1. Joe had |||||| marbles. He gave |||||| to Tom. How many did he have left?
2. Jane counted |||||| cars on one train and |||||| cars on another. How many did she count in all?
3. Sue had |||||| cents. She spent |||||| cents for an apple. How much did she have left?
4. Tom is |||||| years old, and Jim is ||||||. How much younger is Jim than Tom?
5. Susan spent |||||| cents for a sandwich and |||||| cents for milk. How much did she spend?
6. In Jane's class there are |||||| children. There are |||||| boys in the class. How many girls are in Jane's class?
7. Tim checked |||||| books out of the library. Later he returned |||||| of the books. How many did he still have?
8. Beth and Sara have |||||| dolls in all. |||||| of the dolls are Sara's. How many of the dolls are Beth's?
9. Jack read |||||| pages in his book. He has |||||| pages yet to read. How many pages are in the book?
10. Ann said, "|||||| years ago, I was |||||| years old." How old is Ann now?

CHAPTER 4 Multiplication

Multiplication and sets

Study the two examples below. They will help you understand multiplication. Give the missing numbers.



We see

3 sets of keys.
4 keys in each set.
12 keys in all.

We think

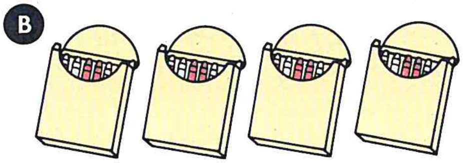
3 fours are ▥.

We write

3 × 4 = 12.

We say

3 times 4 equals ▥.



We see

4 boxes of crayons.
5 crayons in each box.
20 crayons in all.

We think

4 fives are ▥.

We write

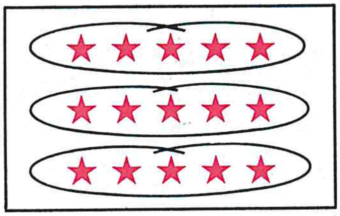
4 × 5 = 20.

We say

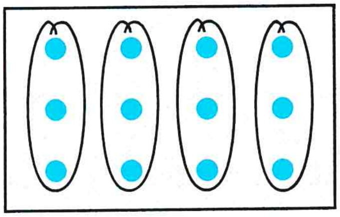
4 times 5 equals ▥.

EXERCISES

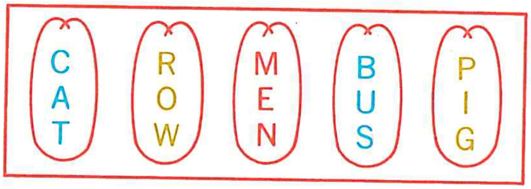
1. [A] How many sets?
   [B] How many stars in each set?
   [C] How many stars in all?
   [D] Solve: $3 \times 5 = \boxed{n}$



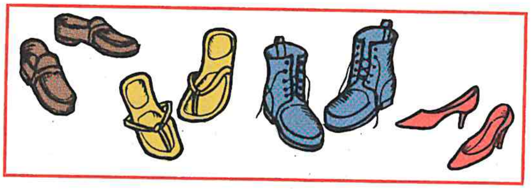
2. [A] How many sets?
   [B] How many dots in each set?
   [C] How many dots in all?
   [D] Solve: $4 \times 3 = \boxed{n}$



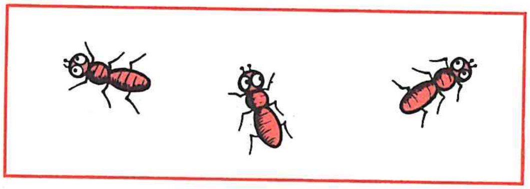
3. [A] How many words?
[B] How many letters in each word?
[C] How many letters in all?
[D] Solve: $5 \times 3 = \boxed{n}$



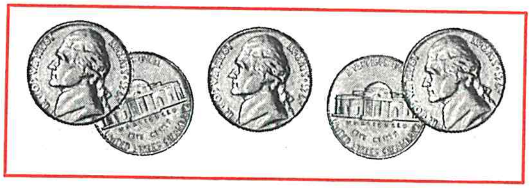
4. [A] How many pairs of shoes?
[B] How many in each pair?
[C] How many shoes in all?
[D] Solve: $4 \times 2 = \boxed{n}$



5. [A] How many ants?
[B] How many legs on each ant?
[C] How many legs in all?
[D] Solve: $3 \times 6 = \boxed{n}$

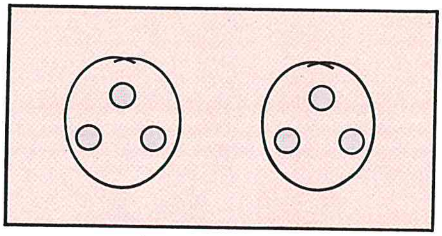


6. [A] How many nickels?
[B] How many cents for each nickel?
[C] How many cents in all?
[D] Solve: $5 \times 5 = \boxed{n}$



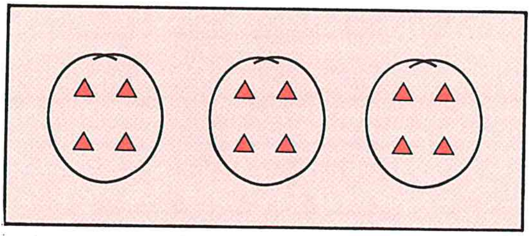
7. Solve the equations.

[A]



$2 \times 3 = \boxed{n}$

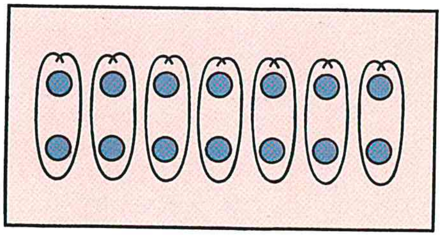
[B]



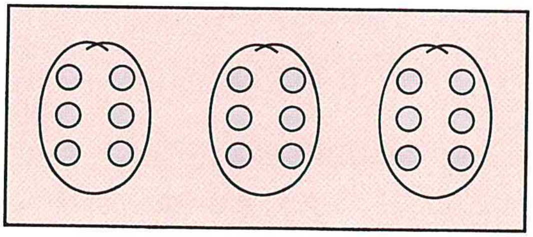
$3 \times 4 = \boxed{n}$

8. Write a multiplication equation for each exercise.

[A]



[B]

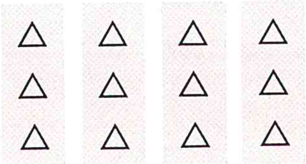


Multiplication and repeated addition

You can use addition to help you find products. Study the two examples below. They will help you understand how addition and multiplication are related. Find the sum. Then give the missing numbers.

4 sets of 3

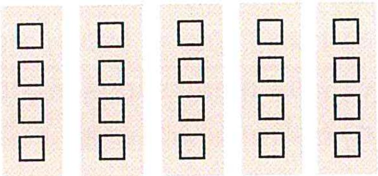
A



3 + 3 + 3 + 3 = n
4 threes are ▒.
4 × 3 = n

5 sets of 4

B

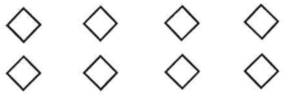


4 + 4 + 4 + 4 + 4 = n
5 fours are ▒.
5 × 4 = n

EXERCISES

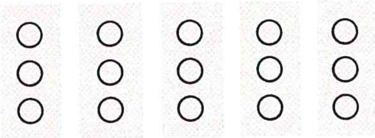
1. Solve the equations.

[A]



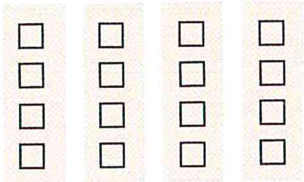
2 + 2 + 2 + 2 = n
4 × 2 = n

[B]



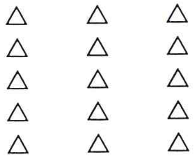
3 + 3 + 3 + 3 + 3 = n
5 × 3 = n

[C]



4 + 4 + 4 + 4 = n
4 × 4 = n

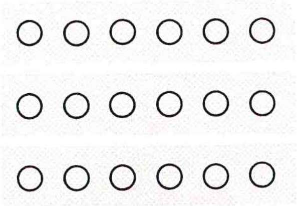
[D]



5 + 5 + 5 = n
3 × 5 = n

2. Find the sum. Then solve the equation.

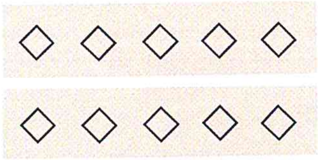
[A]



$$\begin{array}{r} 6 \\ 6 \\ +6 \\ \hline ▒ \end{array}$$

3 × 6 = n

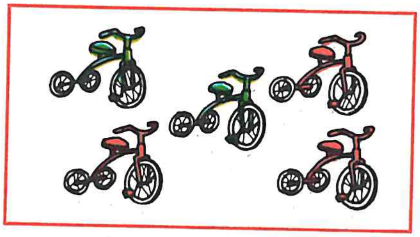
[B]



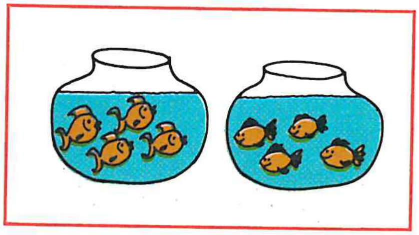
$$\begin{array}{r} 5 \\ +5 \\ \hline ▒ \end{array}$$

2 × 5 = n

3. [A] How many tricycles?
[B] How many wheels on each tricycle?
[C] How many wheels in all?
[D] Write an addition equation about the sets.
[E] Write a multiplication equation about the sets.



4. [A] How many bowls?
[B] How many fish in each bowl?
[C] How many fish in all?
[D] Write an addition equation about the sets.
[E] Write a multiplication equation about the sets.



5. Solve the equations.

[A] $4 + 4 + 4 = \boxed{n}$
$3 \times 4 = \boxed{n}$

[B] $6 + 6 + 6 = \boxed{n}$
$3 \times 6 = \boxed{n}$

[C] $5 + 5 + 5 + 5 = \boxed{n}$
$4 \times 5 = \boxed{n}$

[D] $3 + 3 + 3 + 3 + 3 = \boxed{n}$
$5 \times 3 = \boxed{n}$

[E] $2 + 2 + 2 + 2 = \boxed{n}$
$4 \times 2 = \boxed{n}$

[F] $1 + 1 + 1 + 1 + 1 = \boxed{n}$
$5 \times 1 = \boxed{n}$

★ **6.** Solve the equations.

[A] Since $27 + 27 + 27 = 81$, we know that $3 \times 27 = \boxed{n}$.

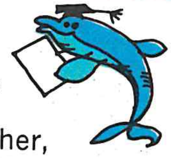
[B] Since $9 + 9 + 9 + 9 = 36$, we know that $4 \times 9 = \boxed{n}$.

[C] Since $438 + 438 = 976$, we know that $2 \times 438 = \boxed{n}$.

[D] Since $46 + 46 + 46 = 138$, we know that $3 \times 46 = \boxed{n}$.

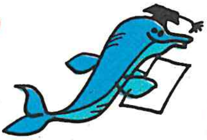
[E] Since $295 + 295 = 590$, we know that $2 \times 295 = \boxed{n}$.

Think



I'm not so very large,
Just over 33.
Add some fives together,
My name you soon will see.

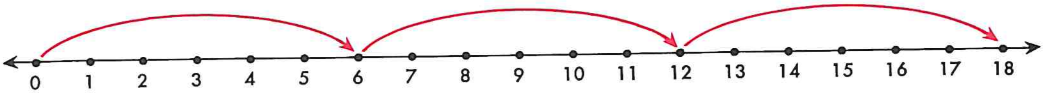
WHO AM I?



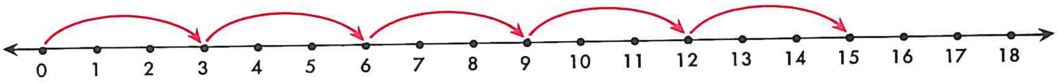
I'm a little over 16
And less than 22.
If you'll just start adding sixes,
My name will come to you.

WHO AM I?

Multiplication and the number line



$$6 + 6 + 6 = 18$$
$$3 \times 6 = 18$$

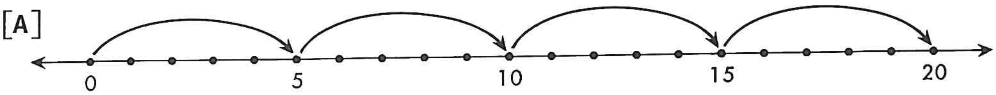


$$3 + 3 + 3 + 3 + 3 = 15$$
$$5 \times 3 = 15$$

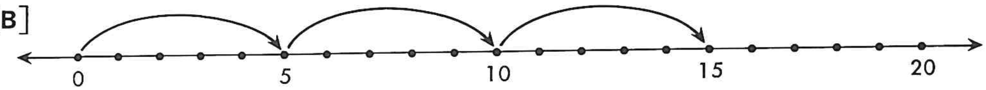
EXERCISES

1. Write an addition and a multiplication equation for each number-line picture.

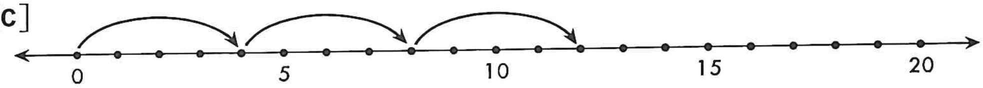
[A]



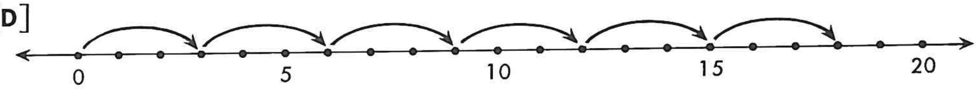
[B]



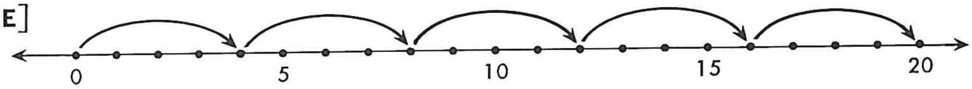
[C]



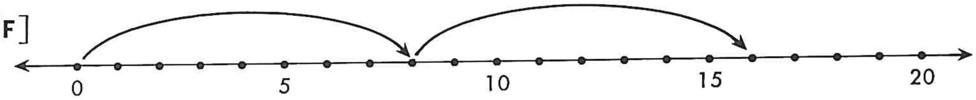
[D]



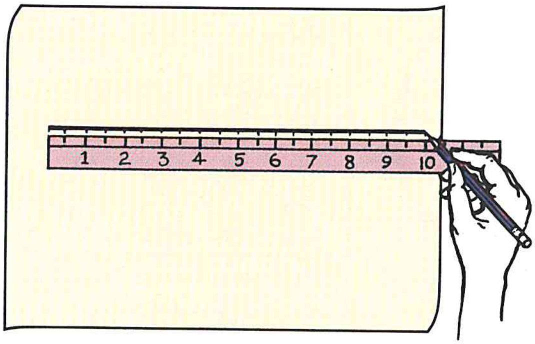
[E]

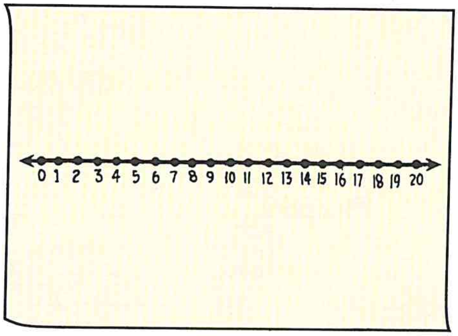


[F]



2. Turn your paper as shown below. Draw a line 10 inches long and mark every half inch. Now label the points, starting at the left with 0. If you like, you may label every fifth point, as in exercise 1.





Now show these equations on your number line.

$$5 + 5 + 5 = 15$$
$$3 \times 5 = 15$$

3. Draw 3 number lines. For each exercise, show the operations on 1 number line.

[A] $4 + 4 + 4$ / 3×4 [B] $7 + 7$ / 2×7 [C] $2 + 2 + 2 + 2 + 2$ / 5×2

4. Write addition and multiplication equations for each part of exercise 3.

★ **5.** Find the missing numbers.

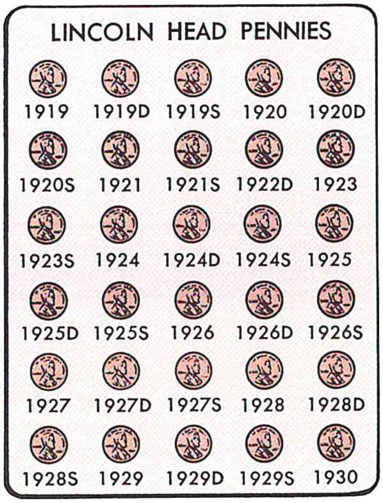
[A] 2, 4, 6, ▥, ▥, ▥, ▥, ▥, 18
[B] 3, 6, 9, ▥, ▥, ▥, ▥, ▥, 27
[C] 4, 8, 12, ▥, ▥, ▥, ▥, ▥, 36
[D] 5, 10, 15, ▥, ▥, ▥, ▥, ▥, 45
[E] 6, 12, 18, ▥, ▥, ▥, ▥, ▥, 54
[F] 7, 14, 21, ▥, ▥, ▥, ▥, ▥, 63
[G] 8, 16, 24, ▥, ▥, ▥, ▥, ▥, 72
[H] 9, 18, 27, ▥, ▥, ▥, ▥, ▥, 81

Collecting pennies

LINCOLN HEAD PENNIES

INDIAN HEAD PENNY

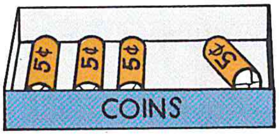
LARGE CENT–1851



1. Some coin collectors keep their coins in a folder. In the folder page above, how many pennies are in each row? How many rows are there? How many pennies in all?

2. In the folder page above, how many pennies are in each column? How many columns are there? How many pennies in all?

3. Jim collects pennies. He made wrappers for some of his extra pennies. He decided to put 5 pennies in each roll. He put 4 rolls of pennies in a box. How many pennies did he put in the box?



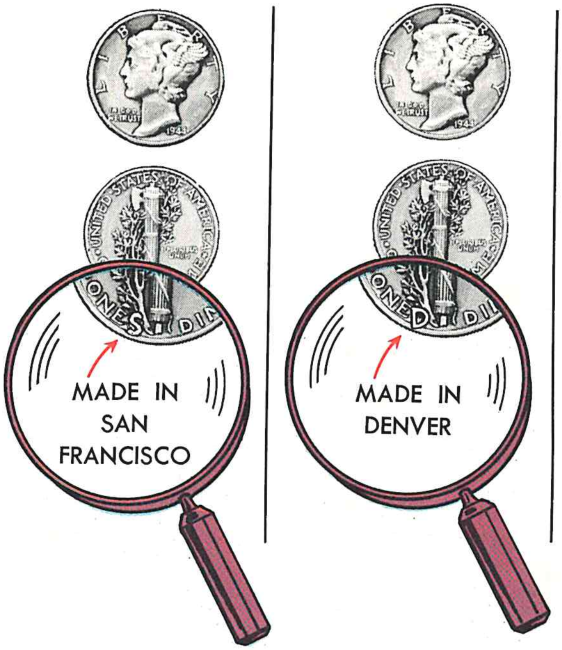
4. Coin collectors often pay more than 1 cent for certain pennies, to complete their collections. Jim's book lists the value of a certain old penny as 5 cents. Jim has three of these pennies. How much are they worth?

5. Jim had 3 rows of Indian Head pennies with 6 in each row. How many Indian Head pennies did he have?

★ 6. Suppose a certain penny is worth 5 cents and an older penny is worth 10 cents. Which is worth more, five of the pennies worth 5 cents or three of the pennies worth 10 cents?

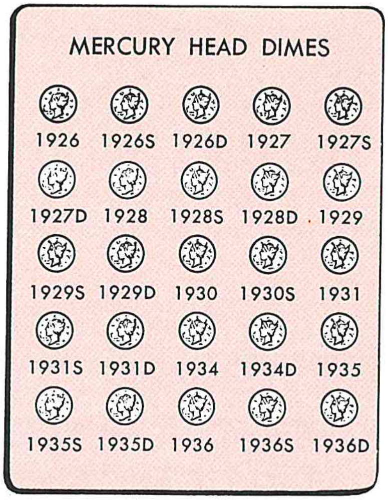
Collecting dimes

MERCURY HEAD DIMES



ROOSEVELT DIME

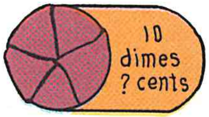
LIBERTY DIME



1. In the folder page, how many dimes are in each row? How many rows are there? How many dimes in all?

2. There are 3 pages in each folder. Bill has 7 folders. How many pages does Bill have in his folders?

3. Bill put 10 dimes in a roll. How many cents is the roll worth?



4. Bill put 4 rolls in a box. How many dimes did Bill put in the box?

5. Ted had 6 rows of Liberty dimes with 3 dimes in each row. How many Liberty dimes did he have?

★ 6. 15,840,000 Mercury dimes were made in San Francisco in 1935. 159,130,000 Mercury dimes were made in Philadelphia in 1945. Which of these dimes do you think Jim is most likely to find?

★ 7. One page has spaces for 7 rows of Roosevelt dimes with 4 dimes in each row. There are only 7 empty spaces. How many Roosevelt dimes are already on the page?

Products and factors

In the multiplication equation 4 × 7 = 28, the number 28 is called the product of 4 and 7.

$$4 \times 7 = 28 \leftarrow \text{product}$$

The numbers 4 and 7 are called factors of 28.

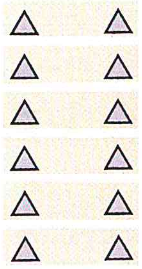
$$\underset{\text{factor}}{\underset{\uparrow}{4}} \times \underset{\text{factor}}{\underset{\uparrow}{7}} = 28$$

EXERCISES

1. [A] In 3 × 5 = 15, the number 15 is the product of what numbers?
   [B] In 4 × 3 = 12, what is the number 12 called?
   [C] In 6 × 7 = 42, the number 42 is the product of what numbers?
   [D] In 8 × 9 = 72, what is the number 72 called?
   [E] In 3 × 5 = 15, the numbers 3 and 5 are factors of what number?
   [F] In 4 × 3 = 12, what are the numbers 4 and 3 called?

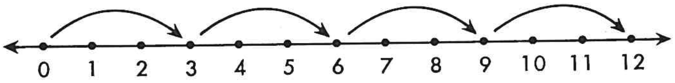
2. Write a multiplication equation for each exercise. Write an "f" over each factor and a "p" over the product as in the example: $\overset{f}{3} \times \overset{f}{4} = \overset{p}{12}$

[A]



[B] 4 + 4 + 4 + 4 + 4 = 20

[C]



★ 3. Tell which mark (>, =, or <) should be placed in the ◍.

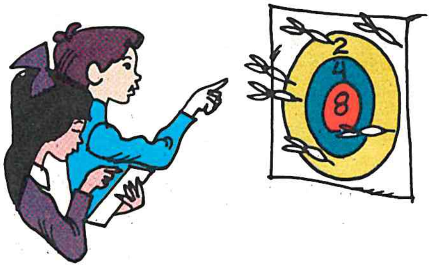
[A] 3 × 4 ◍ 4 + 4 + 4
[B] 3 × 4 ◍ 2 × 4
[C] 4 × 7 ◍ 4 × 6
[D] 6 × 7 ◍ 7 × 7
[E] 8 × 9 ◍ 7 × 9

[F] 4 × 3 ◍ 4 + 4 + 4
[G] 80 ◍ 9 × 10
[H] 6 × 7 ◍ 7 × 6
[I] 4 × 8 ◍ 4 × 7
[J] 700 ◍ 7 × 100

[K] 2 × 5 ◍ 5 + 5
[L] 6 + 6 ◍ 3 × 6
[M] 4 × 5 ◍ 5 × 4
[N] 4 × 5 ◍ 10 × 10
[O] 3 × 5 ◍ 4 × 5

Throwing darts

Ken made a dart board.



1. The first time he threw 6 darts, the board looked like this. Nancy was scorekeeper. She wrote $2+2+2+2+2=10$. Ken found his score by multiplication. Give the multiplication problem Ken worked.

2. When Sue's turn came, she threw 3 darts in the red center. She missed the board with the other 3 darts. What was Sue's score?

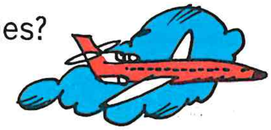
3. In one game Bob threw all 6 darts in the gray ring. What was his score?

4. Jane threw 3 darts. Her score was 14. Where did the darts land?

5. John threw 3 darts. His score was 12. Where could his darts have landed?

Short Stories

1. 3 engines on each jet.
   5 jets.
   How many engines?



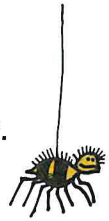
2. 5 stamps in each row.
   5 rows.
   How many stamps?

3. 5 puppies.
   4 legs per puppy.
   How many legs?

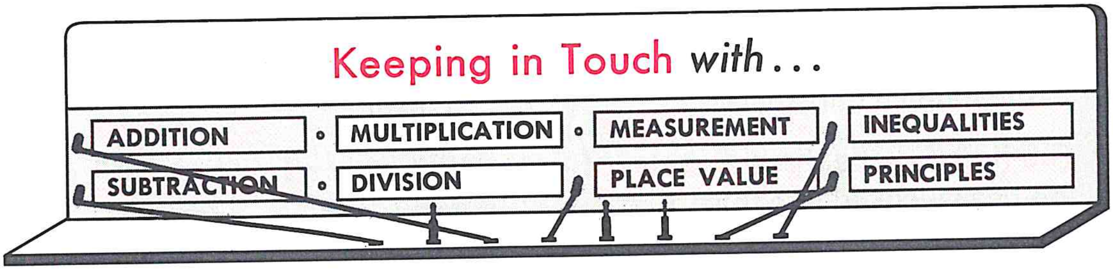
4. 4 chairs in each row.
   3 rows.
   How many chairs?

5. 6 legs on an insect.
   3 insects.
   How many legs?

6. 8 legs on a spider.
   2 spiders.
   How many legs?



Keeping in Touch with . . .



1. For each pair, write the larger number on your paper.

[A] 3764; 4764

[B] 3894; 3943

[C] 67,289; 67,290

[D] 543,289; 542,290

2. Write numerals for these numbers.

[A] four hundred twenty-nine

[B] eight thousand four hundred twenty-nine

[C] sixty-eight thousand four hundred twenty-nine

[D] two hundred sixty-eight thousand, four hundred twenty-nine

3. Solve the equations.

[A] $348 = 300 + 40 + \boxed{n}$

[B] $586 = \boxed{n} + 80 + 6$

[C] $295 = 200 + \boxed{n} + 5$

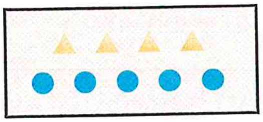
[D] $5423 = 5000 + 400 + 20 + \boxed{n}$

[E] $6285 = 6000 + \boxed{n} + 80 + 5$

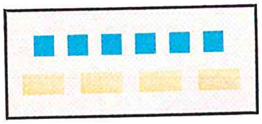
[F] $9876 = \boxed{n} + 800 + 70 + 6$

4. Write 2 addition and 2 subtraction equations for each exercise.

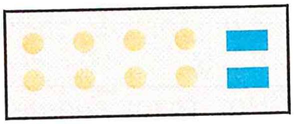
[A]



[B]



[C]



5. Measure the left edge of this page to the nearest inch.

6. Solve the equations.

[A] $6 + 7 = \boxed{n}$

[B] $7 + 6 = \boxed{n}$

[C] $8 + 4 = \boxed{n}$

[D] $4 + 8 = \boxed{n}$

[E] $9 + 3 = \boxed{n}$

[F] $3 + 9 = \boxed{n}$

[G] $5 + 4 = \boxed{n}$

[H] $4 + 5 = \boxed{n}$

7. Solve the equations.

[A] $(4 + 3) + 6 = \boxed{n}$

[B] $4 + (3 + 6) = \boxed{n}$

[C] $(5 + 2) + 4 = \boxed{n}$

[D] $5 + (2 + 4) = \boxed{n}$

[E] $(7 + 3) + 6 = \boxed{n}$

[F] $7 + (3 + 6) = \boxed{n}$

[G] $(8 + 4) + 3 = \boxed{n}$

[H] $8 + (4 + 3) = \boxed{n}$

8. Solve the equations.

[A] $7 + 6 = 10 + \boxed{n}$
[B] $9 + 3 = 10 + \boxed{n}$
[C] $8 + 5 = 10 + \boxed{n}$
[D] $7 + 7 = 10 + \boxed{n}$
[E] $8 + 7 = 10 + \boxed{n}$
[F] $9 + 5 = 10 + \boxed{n}$

9. Find the differences.

[A] Since $8 + 9 = 17$, we know that $17 - 9 = \boxed{n}$.
[B] Since $13 + 24 = 37$, we know that $37 - 24 = \boxed{n}$.
[C] Since $29 + 46 = 75$, we know that $75 - 46 = \boxed{n}$.
[D] Since $48 + 26 = 74$, we know that $74 - 26 = \boxed{n}$.
[E] Since $95 + 137 = 232$, we know that $232 - 137 = \boxed{n}$.

10. Find the sums and differences.

[A] $\begin{array}{r}16\\-7\\\hline\end{array}$ [B] $\begin{array}{r}8\\+7\\\hline\end{array}$ [C] $\begin{array}{r}13\\-6\\\hline\end{array}$ [D] $\begin{array}{r}12\\-8\\\hline\end{array}$ [E] $\begin{array}{r}7\\+9\\\hline\end{array}$ [F] $\begin{array}{r}6\\+8\\\hline\end{array}$

[G] $\begin{array}{r}35\\-14\\\hline\end{array}$ [H] $\begin{array}{r}23\\+66\\\hline\end{array}$ [I] $\begin{array}{r}44\\-13\\\hline\end{array}$ [J] $\begin{array}{r}89\\-37\\\hline\end{array}$ [K] $\begin{array}{r}26\\+42\\\hline\end{array}$ [L] $\begin{array}{r}76\\-35\\\hline\end{array}$

[M] $\begin{array}{r}34\\+27\\\hline\end{array}$ [N] $\begin{array}{r}45\\+38\\\hline\end{array}$ [O] $\begin{array}{r}74\\-26\\\hline\end{array}$ [P] $\begin{array}{r}93\\-47\\\hline\end{array}$ [Q] $\begin{array}{r}26\\+49\\\hline\end{array}$ [R] $\begin{array}{r}32\\-18\\\hline\end{array}$

[S] $\begin{array}{r}85\\+69\\\hline\end{array}$ [T] $\begin{array}{r}123\\-64\\\hline\end{array}$ [U] $\begin{array}{r}48\\+75\\\hline\end{array}$ [V] $\begin{array}{r}97\\-69\\\hline\end{array}$ [W] $\begin{array}{r}84\\+66\\\hline\end{array}$ [X] $\begin{array}{r}147\\-75\\\hline\end{array}$

11. Find the missing numbers.

[A] $\boxed{n} + 6 = 14$
[B] $\boxed{n} - 5 = 8$
[C] $7 + \boxed{n} = 17$
[D] $14 - \boxed{n} = 8$
[E] $\boxed{n} + 7 = 12$
[F] $8 + \boxed{n} = 16$
[G] $12 - \boxed{n} = 4$
[H] $\boxed{n} - 5 = 6$
[I] $13 + \boxed{n} = 18$
[J] $\boxed{n} - 4 = 12$
[K] $15 - \boxed{n} = 0$
[L] $10 + \boxed{n} = 20$

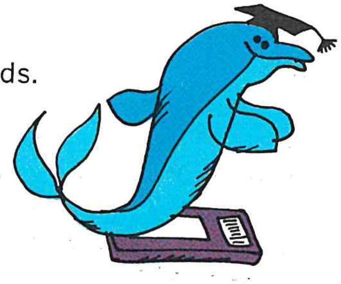
Think

Alan and Bob together weigh 90 pounds.
Alan, Bob, and Jim together weigh 148 pounds.

1. How much does Jim weigh?

Alan and Jim together weigh 105 pounds.

2. How much does Alan weigh?
3. How much does Bob weigh?



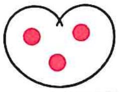
One in multiplication

Solve the equations.

A 3 sets of 1 dot

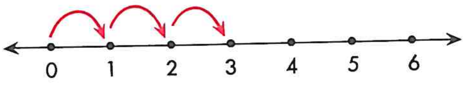
$3 \times 1 = \boxed{n}$

B 1 set of 3 dots



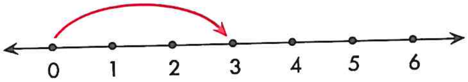
$1 \times 3 = \boxed{n}$

C 3 jumps of 1 unit



$3 \times 1 = \boxed{n}$

D 1 jump of 3 units



$1 \times 3 = \boxed{n}$

EXERCISES

1. Find the products.

[A] $9 \times 1 = \boxed{n}$
[B] $1 \times 9 = \boxed{n}$
[C] $7 \times 1 = \boxed{n}$
[D] $1 \times 7 = \boxed{n}$
[E] $12 \times 1 = \boxed{n}$
[F] $1 \times 12 = \boxed{n}$
[G] $35 \times 1 = \boxed{n}$
[H] $1 \times 35 = \boxed{n}$
[I] $97 \times 1 = \boxed{n}$
[J] $1 \times 83 = \boxed{n}$
[K] $463 \times 1 = \boxed{n}$
[L] $1 \times 8275 = \boxed{n}$

2. Solve the equations.

[A] $8 \times \boxed{n} = 8$
[B] $\boxed{n} \times 1 = 27$
[C] $6 \times \boxed{n} = 6$
[D] $48 \times 1 = \boxed{n}$
[E] $34 \times \boxed{n} = 34$
[F] $\boxed{n} \times 19 = 19$
[G] $1 \times \boxed{n} = 256$
[H] $\boxed{n} \times 1 = 1$
[I] $37 \times \boxed{n} = 37$
[J] $\boxed{n} \times 1 = 136$
[K] $1 \times \boxed{n} = 3428$
[L] $75 \times 1 = \boxed{n}$

3. Complete this statement.
The product of any number and one is __?__.

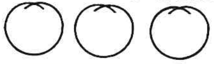
Think

1. The product of two numbers is 15. Their difference is 2. What are the numbers?
2. What two numbers have a product of 20 and a difference of 19?
3. Find two numbers so that their product is less than their sum.

Zero in multiplication

Solve the equations.

A 3 sets of 0 dots

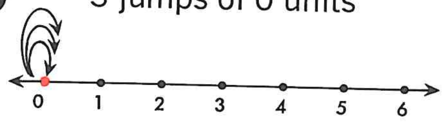


$3 \times 0 = \boxed{n}$

B 0 sets of 3 dots

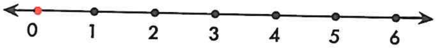
$0 \times 3 = \boxed{n}$

C 3 jumps of 0 units



$3 \times 0 = \boxed{n}$

D 0 jumps of 3 units



$0 \times 3 = \boxed{n}$

EXERCISES

1. Find the products.

[A] $9 \times 0 = \boxed{n}$
[B] $0 \times 9 = \boxed{n}$
[C] $7 \times 0 = \boxed{n}$
[D] $0 \times 7 = \boxed{n}$
[E] $12 \times 0 = \boxed{n}$
[F] $0 \times 12 = \boxed{n}$
[G] $35 \times 0 = \boxed{n}$
[H] $0 \times 35 = \boxed{n}$
[I] $97 \times 0 = \boxed{n}$
[J] $0 \times 83 = \boxed{n}$
[K] $463 \times 0 = \boxed{n}$
[L] $0 \times 8275 = \boxed{n}$

2. Solve the equations.

[A] $8 \times \boxed{n} = 0$
[B] $\boxed{n} \times 7 = 0$
[C] $0 \times 6 = \boxed{n}$
[D] $19 \times \boxed{n} = 0$
[E] $0 \times 56 = \boxed{n}$
[F] $74 \times \boxed{n} = 0$
[G] $\boxed{n} \times 62 = 0$
[H] $58 \times \boxed{n} = 0$
[I] $0 \times 254 = \boxed{n}$
[J] $\boxed{n} \times 723 = 0$
[K] $648 \times 0 = \boxed{n}$
[L] $342 \times \boxed{n} = 0$

3. Complete this statement.

The product of any number and zero is _?_.

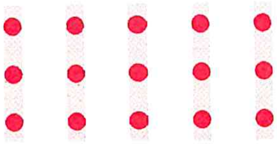
4. In the following exercises, some of the equations have just **one** solution, some have **many** solutions and some have **no** solution.
Answer: **one, many,** or **none.**

[A] $\boxed{n} \times 6 = 0$
[B] $0 \times \boxed{n} = 6$
[C] $0 \times \boxed{n} = 0$
[D] $6 \times 0 = \boxed{n}$
[E] $\boxed{n} \times 0 = 0$
[F] $\boxed{n} \times 0 = 8$

The order principle for multiplication

We can think about 15 dots in two different ways. Solve the equations.

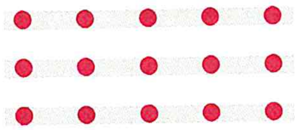
In columns



We see 5 sets of 3.

We write: $5 \times 3 = \boxed{n}$

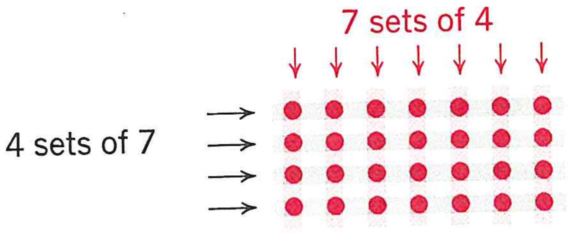
In rows



We see 3 sets of 5.

We write: $3 \times 5 = \boxed{n}$

Here are two ways to think about 28 dots. Give the missing numbers.



$4 \times 7 = \boxed{n}$

$7 \times 4 = \boxed{n}$

$4 \times 7 = 7 \times 4$

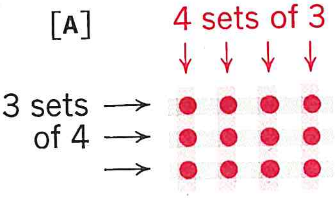
Whenever the factors are 4 and 7, the product is ▥.
We call this idea:

The **ORDER** principle for multiplication.

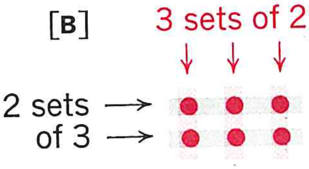
EXERCISES

1. Write 2 multiplication equations for each set.

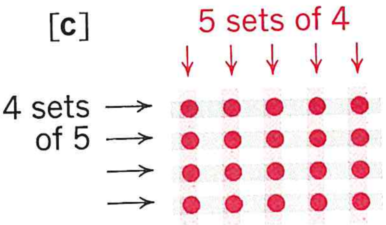
[A]



[B]



[C]



2. Solve the equations.

[A] $5 \times 4 = 4 \times \boxed{n}$

[B] $9 \times 8 = \boxed{n} \times 9$

[C] $\boxed{n} \times 7 = 7 \times 8$

[D] $6 \times \boxed{n} = 9 \times 6$

[E] $853 \times \boxed{n} = 324 \times 853$

[F] $976 \times 345 = \boxed{n} \times 976$

3. Find the products.

[A] Since $4 \times 6 = 24$, we know that $6 \times 4 = \boxed{n}$.
[B] Since $5 \times 8 = 40$, we know that $8 \times 5 = \boxed{n}$.
[C] Since $7 \times 9 = 63$, we know that $9 \times 7 = \boxed{n}$.
[D] Since $9 \times 8 = 72$, we know that $8 \times 9 = \boxed{n}$.
[E] Since $12 \times 3 = 36$, we know that $3 \times 12 = \boxed{n}$.
[F] Since $4 \times 14 = 56$, we know that $14 \times 4 = \boxed{n}$.
[G] Since $16 \times 9 = 144$, we know that $9 \times 16 = \boxed{n}$.
[H] Since $12 \times 16 = 192$, we know that $16 \times 12 = \boxed{n}$.

4. Find the products. Use the table.

[A] 92×65
[B] 24×84
[C] 47×38
[D] 15×68
[E] 76×29
[F] 83×38
[G] 71×17
[H] 82×34
[I] 27×56
[J] 27×53
[K] 64×25
[L] 65×93

$53 \times 27 = 1431$	$65 \times 92 = 5980$
$68 \times 15 = 1020$	$29 \times 76 = 2204$
$25 \times 64 = 1600$	$84 \times 24 = 2016$
$34 \times 82 = 2788$	$93 \times 65 = 6045$
$56 \times 27 = 1512$	$38 \times 83 = 3154$
$38 \times 47 = 1786$	$17 \times 71 = 1207$

Short stories

Answer the questions. Then write a multiplication equation about each exercise.

1. [A] Three 5-cent stamps
cost how much?
(Answer: 15¢)

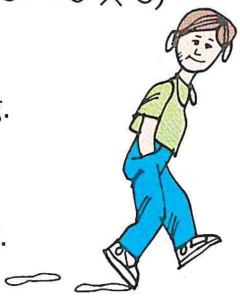
[B] Five 3-cent stamps
cost how much?
(Answer: 15¢)
(Equation: $3 \times 5 = 5 \times 3$)

2. [A] 5 marbles in a bag.
7 bags.
How many marbles?

[B] 7 marbles in a bag.
5 bags.
How many marbles?

3. [A] 4 steps.
Each 2 feet long.
How far?

[B] 2 steps.
Each 4 feet long.
How far?



4. [A] 2 boys.
3 arrows each.
How many arrows?

[B] 3 boys.
2 arrows each.
How many arrows?

The grouping principle for multiplication

If we do **not** change the order when multiplying with 3 factors, we have a choice of which factors we can multiply first.

Factors: 3, 2, 4

We could multiply these first.

$3 \times 2 \times 4$

$(3 \times 2) \times 4$

We think: $6 \times 4 = 24$

or

We could multiply these first.

$3 \times 2 \times 4$

$3 \times (2 \times 4)$

We think: $3 \times 8 = 24$

When we multiply, we can change the **GROUPING** and get the same product.

EXERCISES

1. Find each product. Use the groupings shown. In each part, check to see that the two different groupings give the same product.

[A] $(5 \times 1) \times 6$ $5 \times (1 \times 6)$
[B] $(2 \times 2) \times 4$ $2 \times (2 \times 4)$
[C] $(4 \times 2) \times 5$ $4 \times (2 \times 5)$
[D] $(3 \times 2) \times 5$ $3 \times (2 \times 5)$

2. Find each product. Choose the grouping that is most helpful. Do not change the order.

[A] $5 \times 2 \times 4$
[B] $9 \times 0 \times 5$
[C] $7 \times 5 \times 2$
[D] $593 \times 497 \times 0$
[E] $8 \times 10 \times 10$
[F] $2 \times 5 \times 3$

3. Solve the equations.

[A] $(3 \times 7) \times 5 = \boxed{n} \times (7 \times 5)$
[B] $(8 \times 6) \times 10 = 8 \times (\boxed{n} \times 10)$
[C] $17 \times (4 \times 29) = (\boxed{n} \times 4) \times 29$
[D] $(\boxed{n} \times 4) \times 7 = 34 \times (4 \times 7)$

4. Find the products.

[A] Since $(4 \times 6) \times 3 = 72$, we know that $4 \times (6 \times 3) = \boxed{n}$.
[B] Since $(5 \times 7) \times 2 = 70$, we know that $5 \times (7 \times 2) = \boxed{n}$.
[C] Since $6 \times (8 \times 7) = 336$, we know that $(6 \times 8) \times 7 = \boxed{n}$.
[D] Since $(4 \times 9) \times 6 = 216$, we know that $4 \times (9 \times 6) = \boxed{n}$.

Rearranging factors

Change the order / grouping and the product is the same.

Because of the order and grouping principles, we can choose any two factors for our first multiplication and get the same product.

Factors: 2, 3, 4

We could multiply these first.		We could multiply these first.		We could multiply these first.
$2 \times 3 \times 4$	or	$2 \times 3 \times 4$	or	$2 \times 3 \times 4$
[A] $(2 \times 3) \times 4$		[E] $(2 \times 4) \times 3$		[I] $(3 \times 4) \times 2$
[B] $(3 \times 2) \times 4$		[F] $(4 \times 2) \times 3$		[J] $(4 \times 3) \times 2$
[C] $4 \times (3 \times 2)$		[G] $3 \times (4 \times 2)$		[K] $2 \times (4 \times 3)$
[D] $4 \times (2 \times 3)$		[H] $3 \times (2 \times 4)$		[L] $2 \times (3 \times 4)$

We can rearrange factors as we please.

EXERCISES

1. Find each of the 12 products in parts A through L in the table above. Are they the same?

2. Find the products. Arrange the factors any way you choose.
   [A] $5 \times 8 \times 2$ [B] $2 \times 9 \times 5$ [C] $4 \times 2 \times 1$ [D] $989 \times 7 \times 0$

3. Find the products.
   [A] Since $3 \times 4 \times 5 = 60$, we know $5 \times 3 \times 4 = \boxed{n}$.
   [B] Since $8 \times 7 \times 6 = 336$, we know $7 \times 8 \times 6 = \boxed{n}$.

4. Find the products. Use the table on the right.
   [A] $3 \times 27 \times 6$
   [B] $5 \times 8 \times 13$
   [C] $4 \times 65 \times 9$
   [D] $17 \times 4 \times 6$
   [E] $4 \times 27 \times 5$
   [F] $65 \times 8 \times 4$
   [G] $3 \times 7 \times 17$
   [H] $13 \times 9 \times 8$

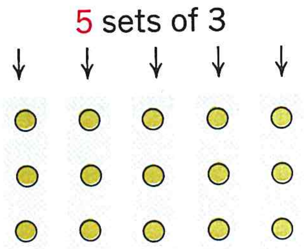
$5 \times 27 \times 4 = 540$
$17 \times 6 \times 4 = 408$
$8 \times 13 \times 9 = 936$
$6 \times 3 \times 27 = 486$
$17 \times 7 \times 3 = 357$
$8 \times 5 \times 13 = 520$
$65 \times 9 \times 4 = 2340$
$8 \times 4 \times 65 = 2080$

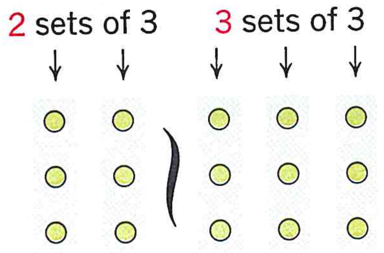
The multiplication-addition principle

DISCUSSION EXERCISES

These exercises will help you understand the **multiplication-addition** principle. It may help you to think of "breaking apart" a number before you multiply. Solve the equations.

1.

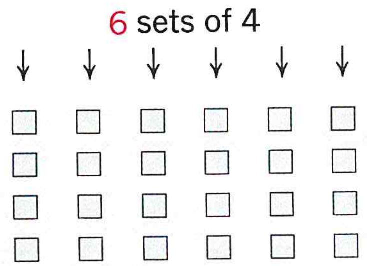


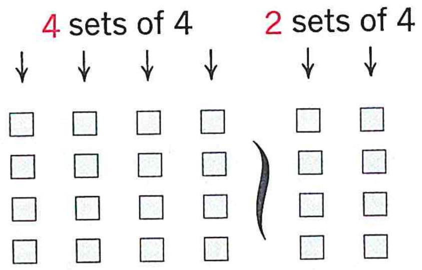


$$5 \times 3 = \boxed{n} \longrightarrow (2 \times 3) + (3 \times 3) = \boxed{n}$$

For 5 **threes,** we can think 2 **threes and** 3 **threes.**

2.

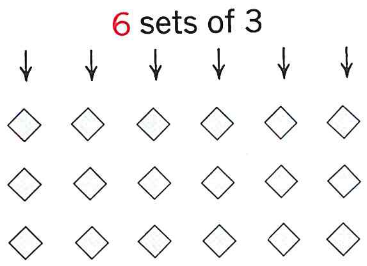


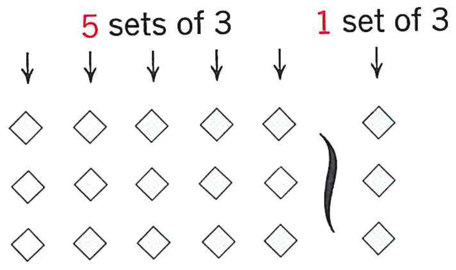


$$6 \times 4 = \boxed{n} \longrightarrow (4 \times 4) + (2 \times 4) = \boxed{n}$$

For 6 **fours,** we can think 4 **fours and** 2 **fours.**

3.



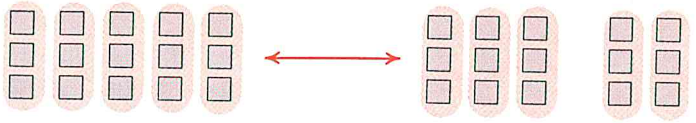


$$6 \times 3 = \boxed{n} \longrightarrow (5 \times 3) + (1 \times 3) = \boxed{n}$$

For 6 **threes,** we can think 5 **threes and** 1 **three.**

EXERCISES

1. Solve the equations.

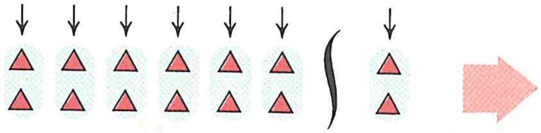
We see → 

We think → 5 threes ⟷ 3 threes and 2 threes

We write → $5 \times 3 = \boxed{n}$ ⟷ $(3 \times 3) + (2 \times 3) = \boxed{n}$

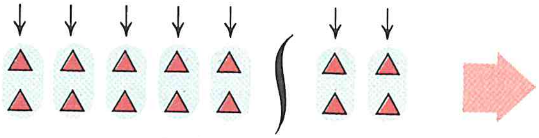
2. Give the missing number of twos.

[A] 7 sets of 2



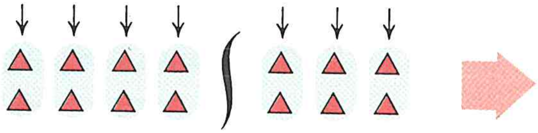
For 7 sets of two, we can think 6 twos and ▥ two.

[B] 7 sets of 2



For 7 sets of two, we can think 5 twos and ▥ twos.

[C] 7 sets of 2



For 7 sets of two, we can think 4 twos and ▥ twos.

3. Solve the equations.

[A] $7 \times 2 = (6 \times 2) + (\boxed{n} \times 2)$

[B] $7 \times 2 = (5 \times 2) + (\boxed{n} \times 2)$

[C] $7 \times 2 = (4 \times 2) + (\boxed{n} \times 2)$

[D] $7 \times 2 = (3 \times 2) + (\boxed{n} \times 2)$

4. Give the missing number. Then solve the equation.

[A] For 6 sets of three, we can think 4 threes and ▥ threes.
$6 \times 3 = (4 \times 3) + (\boxed{n} \times 3)$

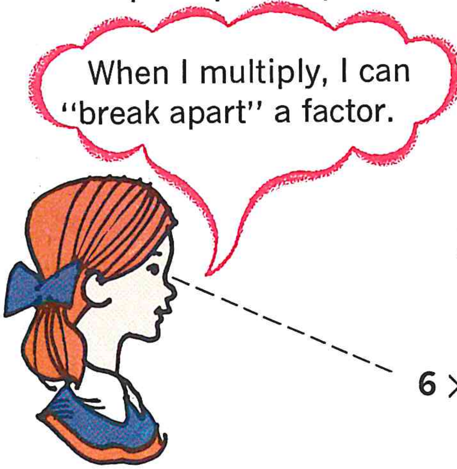
[B] For 5 sets of four, we can think 2 fours and ▥ fours.
$5 \times 4 = (2 \times 4) + (\boxed{n} \times 4)$

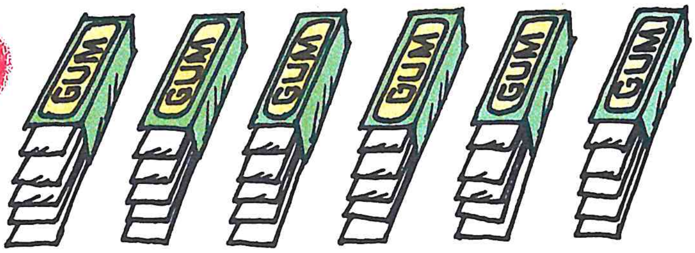
[C] For 8 sets of two, we can think 4 twos and ▥ twos.
$8 \times 2 = (4 \times 2) + (\boxed{n} \times 2)$

[D] For 4 sets of six, we can think 3 sixes and ▥ sixes.
$4 \times 6 = (3 \times 6) + (\boxed{n} \times 6)$

The multiplication-addition principle again

Diane is thinking about the multiplication-addition principle. Explain Diane's thinking.


When I multiply, I can "break apart" a factor.



6 fives

4 fives and 2 fives

$6 \times 5 = (4 \times 5) + (2 \times 5)$

EXERCISES

1. Find the missing number. Then solve the equation.

[A] 5 twos → 3 twos and ▥ twos
$5 \times 2 = (3 \times 2) + (\boxed{n} \times 2)$

[B] 5 twos → 4 twos and ▥ twos
$5 \times 2 = (4 \times 2) + (\boxed{n} \times 2)$

[C] 6 fours → ▥ fours and 3 fours
$6 \times 4 = (\boxed{n} \times 4) + (3 \times 4)$

[D] 6 fours → 5 fours and ▥ fours
$6 \times 4 = (5 \times 4) + (\boxed{n} \times 4)$

[E] 6 fours → 4 fours and ▥ fours
$6 \times 4 = (4 \times 4) + (\boxed{n} \times 4)$

[F] 6 fours → ▥ fours and 1 four
$6 \times 4 = (\boxed{n} \times 4) + (1 \times 4)$

[G] 7 fours → ▥ fours and 3 fours
$7 \times 4 = (\boxed{n} \times 4) + (3 \times 4)$

[H] 7 fours → 5 fours and ▥ fours
$7 \times 4 = (5 \times 4) + (\boxed{n} \times 4)$

[I] 7 fours → 6 fours and ▥ fours
$7 \times 4 = (6 \times 4) + (\boxed{n} \times 4)$

[J] 8 fives → 5 fives and ▥ fives
$8 \times 5 = (5 \times 5) + (\boxed{n} \times 5)$

[K] 8 fives → ▥ fives and 6 fives
$8 \times 5 = (\boxed{n} \times 5) + (6 \times 5)$

[L] 8 fives → 7 fives and ▥ fives
$8 \times 5 = (7 \times 5) + (\boxed{n} \times 5)$

2. Solve the equations.

[A] Since $(2 \times 4) + (3 \times 4) = 20$, we know that $5 \times 4 = \boxed{n}$.

[B] Since $(4 \times 3) + (3 \times 3) = 21$, we know that $7 \times 3 = \boxed{n}$.

[C] Since $(5 \times 4) + (2 \times 4) = 28$, we know that $7 \times 4 = \boxed{n}$.

[D] Since $(6 \times 5) + (2 \times 5) = 40$, we know that $8 \times 5 = \boxed{n}$.

[E] Since $(3 \times 7) + (5 \times 7) = 56$, we know that $8 \times 7 = \boxed{n}$.

3. Solve the equations.

[A] $5 \times 8 = (2 \times 8) + (\boxed{n} \times 8)$

[B] $4 \times 6 = (\boxed{n} \times 6) + (2 \times 6)$

[C] $6 \times 5 = (5 \times 5) + (1 \times \boxed{n})$

[D] $7 \times 3 = (4 \times 3) + (3 \times \boxed{n})$

[E] $8 \times 2 = (7 \times \boxed{n}) + (1 \times 2)$

[F] $9 \times 6 = (5 \times 6) + (\boxed{n} \times 6)$

[G] $8 \times 4 = (4 \times \boxed{n}) + (4 \times 4)$

[H] $6 \times 9 = (3 \times 9) + (3 \times \boxed{n})$

4. Find the products.

[A] $\left.\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 2 = 6 \end{array}\right\} 5 \times 2 = \boxed{n}$

[B] $\left.\begin{array}{l} 2 \times 3 = 6 \\ 3 \times 3 = 9 \end{array}\right\} 5 \times 3 = \boxed{n}$

[C] $\left.\begin{array}{l} 2 \times 4 = 8 \\ 3 \times 4 = 12 \end{array}\right\} 5 \times 4 = \boxed{n}$

[D] $\left.\begin{array}{l} 3 \times 2 = 6 \\ 4 \times 2 = 8 \end{array}\right\} 7 \times 2 = \boxed{n}$

[E] $\left.\begin{array}{l} 3 \times 3 = 9 \\ 4 \times 3 = 12 \end{array}\right\} 7 \times 3 = \boxed{n}$

5. Find the products.

[A] $4 \times 4 = 16 \longrightarrow 5 \times 4 = \boxed{n}$

[B] $5 \times 6 = 30 \longrightarrow 6 \times 6 = \boxed{n}$

[C] $4 \times 7 = 28 \longrightarrow 5 \times 7 = \boxed{n}$

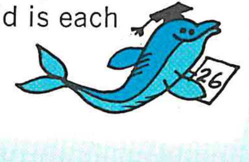
[D] $5 \times 8 = 40 \longrightarrow 6 \times 8 = \boxed{n}$

[E] $6 \times 7 = 42 \longrightarrow 7 \times 7 = \boxed{n}$

[F] $4 \times 9 = 36 \longrightarrow 5 \times 9 = \boxed{n}$

Think

Tom is 4 years older than his younger sister and 6 years older than his younger brother. The sum of their ages is 26. How old is each child?



Multiplication facts

There are 100 basic multiplication facts. Many of the facts are easy to figure out and remember. In this lesson, we will look at some of the easier facts.

DISCUSSION EXERCISES

1. "0" facts Complete the following sentence. The product of any number and 0 is $\boxed{n}$. From this principle, we can easily find the products in the 0 row and the 0 column.

2. "1" facts Complete the following sentence. The product of any number and $\boxed{n}$ is that number. From this principle, we can easily find the products in the 1 row and the 1 column.

0 col. ↓ 1 col. ↓

0 row →
1 row →

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2								
3	0	3								
4	0	4								
5	0	5								
6	0	6								
7	0	7								
8	0	8								
9	0	9								

3. "2" facts Solve the equations. Then give the products for **A** through **H** in the table.

[**A**] Since $2 + 2 = 4$, we know $2 \times 2 = \boxed{n}$.
[**B**] Since $3 + 3 = 6$, we know $2 \times 3 = \boxed{n}$.
[**C**] Since $4 + 4 = 8$, we know $2 \times 4 = \boxed{n}$.
[**D**] Since $5 + 5 = 10$, we know $2 \times 5 = \boxed{n}$.
[**E**] Since $6 + 6 = 12$, we know $2 \times 6 = \boxed{n}$.
[**F**] Since $7 + 7 = 14$, we know $2 \times 7 = \boxed{n}$.
[**G**] Since $8 + 8 = 16$, we know $2 \times 8 = \boxed{n}$.
[**H**] Since $9 + 9 = 18$, we know $2 \times 9 = \boxed{n}$.

2 col. ↓

2 row ↳

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2			**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
3			**I**							
4			**J**							
5			**K**							
6			**L**							
7			**M**							
8			**N**							
9			**O**							

4. Solve.

[**A**] Since $2 \times 3 = 6$, we know that $3 \times 2 = \boxed{n}$.
[**B**] Where does the product for 3×2 go in the table?
[**C**] Why is the product for **J** the same as the product for **C**?
[**D**] Give the products for **I** through **O** in the "2" column.

5. "3" facts Solve the equations. Then give the products for **A** through **G** in the "3" row.

[A] $3 \times 3 \longrightarrow (2 \times 3) + 3 = \boxed{n}$
[B] $3 \times 4 \longrightarrow (2 \times 4) + 4 = \boxed{n}$
[C] $3 \times 5 \longrightarrow (2 \times 5) + 5 = \boxed{n}$
[D] $3 \times 6 \longrightarrow (2 \times 6) + 6 = \boxed{n}$
[E] $3 \times 7 \longrightarrow (2 \times 7) + 7 = \boxed{n}$
[F] $3 \times 8 \longrightarrow (2 \times 8) + 8 = \boxed{n}$
[G] $3 \times 9 \longrightarrow (2 \times 9) + 9 = \boxed{n}$

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3				A	B	C	D	E	F	G
4				H						
5				I						
6				J						
7				K						
8				L						
9				M						

6. [A] Since $3 \times 4 = 12$, we know that $4 \times 3 = \boxed{n}$.
[B] Where in the table does the product for 4 × 3 belong?
[C] Why is the product for **I** the same as the product for **C**?
[D] Give the products for **H** through **M** in the "3" column.

EXERCISES

1. Find the products.

[A] 6 × 1
[B] 1 × 6
[C] 2 × 8
[D] 4 × 3
[E] 3 × 0
[F] 6 × 1
[G] 3 × 8
[H] 0 × 9
[I] 5 × 3
[J] 1 × 8
[K] 7 × 3
[L] 2 × 8
[M] 0 × 5
[N] 2 × 2
[O] 3 × 8

2. Find the products.

[A] $\begin{array}{r} 6 \\ \underline{\times 2} \end{array}$ [B] $\begin{array}{r} 1 \\ \underline{\times 7} \end{array}$ [C] $\begin{array}{r} 4 \\ \underline{\times 0} \end{array}$ [D] $\begin{array}{r} 3 \\ \underline{\times 2} \end{array}$ [E] $\begin{array}{r} 2 \\ \underline{\times 9} \end{array}$ [F] $\begin{array}{r} 4 \\ \underline{\times 3} \end{array}$ [G] $\begin{array}{r} 3 \\ \underline{\times 3} \end{array}$ [H] $\begin{array}{r} 8 \\ \underline{\times 2} \end{array}$

[I] $\begin{array}{r} 7 \\ \underline{\times 1} \end{array}$ [J] $\begin{array}{r} 0 \\ \underline{\times 6} \end{array}$ [K] $\begin{array}{r} 5 \\ \underline{\times 2} \end{array}$ [L] $\begin{array}{r} 3 \\ \underline{\times 6} \end{array}$ [M] $\begin{array}{r} 2 \\ \underline{\times 7} \end{array}$ [N] $\begin{array}{r} 9 \\ \underline{\times 3} \end{array}$ [O] $\begin{array}{r} 0 \\ \underline{\times 5} \end{array}$ [P] $\begin{array}{r} 2 \\ \underline{\times 5} \end{array}$

3. Copy and give the missing numbers.

[A] 2, 4, 6, 8, ▥, ▥, ▥, 16, ▥

[B] 3, 6, 9, ▥, ▥, 18, ▥, ▥, 27

4. Copy and complete the table.

×	5	6	7	8
0				
1				8
2		12		
3	15			

Using four as a factor

If you have mastered all the facts from the last lesson, you have only 36 of the 100 facts yet to learn. When you have mastered the facts in this lesson, you will have just 25 left to learn.

DISCUSSION EXERCISES

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4					A	B	C	D	E	F
5					G					
6					H					
7					I					
8					J					
9					K					

1. Solve the equations. Then give the products for **A** through **F** in the "4" row.

[**A**] To find 4×5, think
2 fives and 2 fives.
or
3 fives and five.

$4 \times 5 = \boxed{n}$

[**B**] To find 4×6, think
$(2 \times 6) + (2 \times 6) = \boxed{n}$.
or
$(3 \times 6) + 6 = \boxed{n}$.

[**C**] To find 4×7, think
$(2 \times 7) + (2 \times 7) = \boxed{n}$.
or
$(3 \times 7) + 7 = \boxed{n}$.

[**D**] To find 4×8, think
$(2 \times 8) + (2 \times 8) = \boxed{n}$.
or
$(3 \times 8) + 8 = \boxed{n}$.

2. [**A**] Since $4 \times 5 = 20$, we know $5 \times 4 = \boxed{n}$.

[**B**] Why is the product for **G** the same as the product for **B**?

[**C**] Give the products for **G** through **K** in the "4" column.

EXERCISES

1. Copy and complete. 4, 8, 12, ▒, ▒, 24, ▒, ▒, 36

2. Find the products.

[**A**] $3 \times 6 = 18 \longrightarrow 4 \times 6 = \boxed{n}$

[**B**] $4 \times 7 = 28 \longrightarrow 7 \times 4 = \boxed{n}$

[**C**] $3 \times 4 = 12 \longrightarrow 4 \times 4 = \boxed{n}$

[**D**] $4 \times 9 = 36 \longrightarrow 9 \times 4 = \boxed{n}$

[**E**] $4 \times 8 = 32 \longrightarrow 8 \times 4 = \boxed{n}$

[**F**] $3 \times 5 = 15 \longrightarrow 4 \times 5 = \boxed{n}$

3. Find the products.

[**A**] 4×3 [**D**] 2×4 [**G**] 4×4

[**B**] 4×6 [**E**] 4×8 [**H**] 4×9

[**C**] 7×4 [**F**] 9×4 [**I**] 5×4

4. Copy and complete the table.

×	5	6	7
3			
4			

Using five as a factor

So far you have studied the gray part of the table. When you finish this lesson, you will have studied all but 16 of the facts.

DISCUSSION EXERCISES

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5						A	B	C	D	E
6						F				
7						G				
8						H				
9						I				

1. If you know that **A** is 25 in the table, what can you say about **B**?

2. To find 5 × 6, you can think 4 sixes and six. Solve: $5 \times 6 = \boxed{n}$

3. Where in the table does the product for 5 × 6 belong?

4. Give the products for **A** through **E** in the "5" row.

5. [**A**] Give the products for **F** through **I** in the "5" column.
   [**B**] Explain why the products in the "5" column are the same as those in the "5" row.

EXERCISES

1. Find the products.

[**A**] 1 × 5
[**B**] 2 × 5
[**C**] 3 × 5
[**D**] 4 × 5
[**E**] 5 × 5
[**F**] 6 × 5
[**G**] 7 × 5
[**H**] 8 × 5
[**I**] 9 × 5
[**J**] 5 × 1
[**K**] 5 × 2
[**L**] 5 × 3
[**M**] 5 × 4
[**N**] 5 × 5
[**O**] 5 × 6
[**P**] 5 × 7
[**Q**] 5 × 8
[**R**] 5 × 9

2. Copy and complete each table.

[**A**]

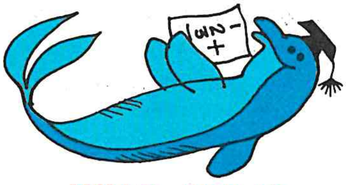
×	6	7
4		
5		

[**B**]

×	4	5
6		
7		

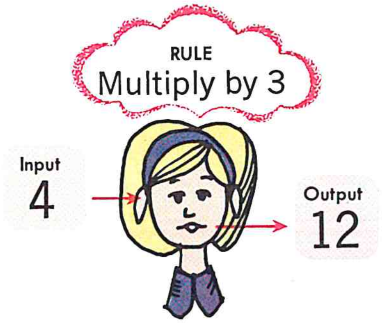
Think

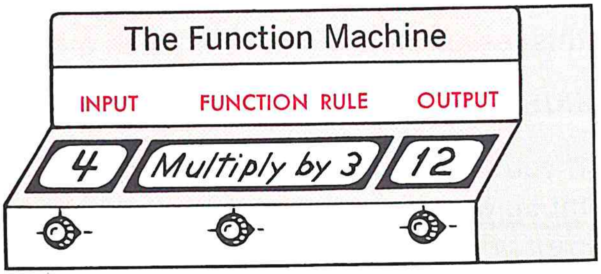
Add the numbers
one, two, three.
Now find their product too.
I'm the answer either way,
Whichever one you do.



WHO AM I?

The function machine





EXERCISES

Think about the function machine and tell what you think should go in each gray space.

1. Function Rule: Multiply by 3

	Input	Output
	2	6
	9	27
[A]	8	▥
[B]	5	▥
[C]	7	▥

2. Function Rule: Multiply by 4

	Input	Output
	2	8
[A]	4	▥
[B]	9	▥
[C]	6	▥
[D]	8	▥

3. Function Rule: Multiply by 5

	Input	Output
[A]	3	▥
[B]	7	▥
	9	45
[C]	6	▥
[D]	8	▥

4. Function Rule: [A] ▥

	Input	Output
	2	10
	3	15
	7	35
[B]	6	▥
[C]	▥	20

★ **5.** Function Rule: Multiply by 2

	Input	Output
	2	4
[A]	5	▥
[B]	▥	8
[C]	▥	14
[D]	▥	12

★ **6.** Function Rule: [A] ▥

	Input	Output
	2	4
	3	9
	5	25
[B]	4	▥
[C]	1	▥

Practice finding products

1. Find the products.

"0" facts

[A] 6 × 0
[B] 0 × 3
[C] 4 × 0
[D] 9 × 0
[E] 3 × 0
[F] 0 × 5
[G] 0 × 1
[H] 0 × 0
[I] 7 × 0
[J] 5 × 0
[K] 1 × 0
[L] 0 × 8

"1" facts

[A] 1 × 4
[B] 3 × 1
[C] 6 × 1
[D] 1 × 8
[E] 7 × 1
[F] 4 × 1
[G] 1 × 1
[H] 1 × 0
[I] 9 × 1
[J] 1 × 6
[K] 1 × 7
[L] 5 × 1

"2" facts

[A] 2 × 7
[B] 4 × 2
[C] 2 × 5
[D] 3 × 2
[E] 8 × 2
[F] 0 × 2
[G] 2 × 2
[H] 5 × 2
[I] 2 × 3
[J] 1 × 2
[K] 2 × 6
[L] 2 × 9

"3" facts

[A] 6 × 3
[B] 3 × 1
[C] 3 × 6
[D] 7 × 3
[E] 3 × 3
[F] 3 × 0
[G] 4 × 3
[H] 3 × 8
[I] 3 × 2
[J] 3 × 4
[K] 5 × 3
[L] 3 × 9

"4" facts

[A] 4 × 5
[B] 1 × 4
[C] 4 × 8
[D] 5 × 4
[E] 4 × 9
[F] 4 × 0
[G] 6 × 4
[H] 3 × 4
[I] 4 × 2
[J] 0 × 4
[K] 4 × 4
[L] 7 × 4

"5" facts

[A] 5 × 4
[B] 5 × 3
[C] 2 × 5
[D] 4 × 5
[E] 5 × 9
[F] 3 × 5
[G] 1 × 5
[H] 5 × 8
[I] 5 × 2
[J] 6 × 5
[K] 5 × 5
[L] 7 × 5

2. Draw a table like this one.
Four products are given.
Find the others.

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2					8				16	
3										
4			8					28		
5										

3. Find the products.

[A] $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$
[B] $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$
[C] $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$
[D] $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$

[E] $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$
[F] $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$
[G] $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$
[H] $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$

[I] $\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$
[J] $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$
[K] $\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$
[L] $\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$

[M] $\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$
[N] $\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$
[O] $\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$
[P] $\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$

Using six as a factor

In this lesson you will study products that have a factor of 6. When you finish the lesson you will have studied all but 9 of the facts.

DISCUSSION EXERCISES

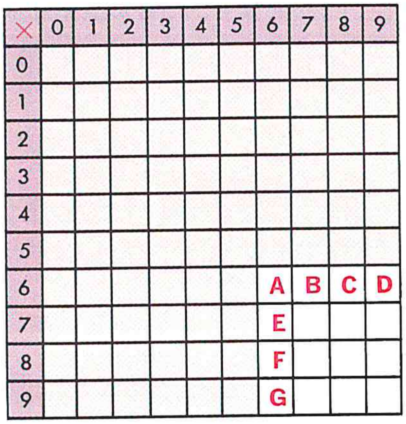
1. Solve the equations. Then give the products for **A** through **D** in the "6" row.

[**A**] To find 6 × 6, think 3 sixes and 3 sixes.
or
5 sixes and six.
$6 \times 6 = \boxed{n}$

[**B**] To find 6 × 7, think 3 sevens and 3 sevens.
or
5 sevens and seven.
$6 \times 7 = \boxed{n}$

[**C**] To find 6 × 8, think $(3 \times 8) + (3 \times 8) = \boxed{n}$.
or
$(5 \times 8) + 8 = \boxed{n}$.

[**D**] To find 6 × 9, think $(3 \times 9) + (3 \times 9)$.
or
$(5 \times 9) + 9$.



×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6							A	B	C	D
7							E			
8							F			
9							G			

2. [**A**] Since $6 \times 7 = 42$, we know $7 \times 6 = \boxed{n}$.

[**B**] Why is the product for **F** the same as the product for **C**?

[**C**] Give the products for **E** through **G** in the "6" column.

EXERCISES

1. Solve the equations.

[**A**] $3 \times 7 = 21 \rightarrow 6 \times 7 = \boxed{n}$
[**B**] $5 \times 8 = 40 \rightarrow 6 \times 8 = \boxed{n}$
[**C**] $10 \times 6 = 60 \rightarrow 9 \times 6 = \boxed{n}$
[**D**] $2 \times 6 = 12 \rightarrow 4 \times 6 = \boxed{n}$
[**E**] $2 \times 6 = 12 \rightarrow 6 \times 6 = \boxed{n}$
[**F**] $4 \times 6 = 24 \rightarrow 5 \times 6 = \boxed{n}$

2. Find the products.

[**A**] 0 × 6
[**B**] 1 × 6
[**C**] 2 × 6
[**D**] 3 × 6
[**E**] 4 × 6
[**F**] 5 × 6
[**G**] 6 × 6
[**H**] 7 × 6
[**I**] 8 × 6
[**J**] 9 × 6
[**K**] 6 × 4
[**L**] 6 × 3
[**M**] 6 × 5
[**N**] 6 × 7
[**O**] 6 × 9
[**P**] 6 × 8
[**Q**] 6 × 1
[**R**] 6 × 2

Using seven as a factor

The end is in sight! When you complete this lesson, you will have studied all but 4 of the 100 facts.

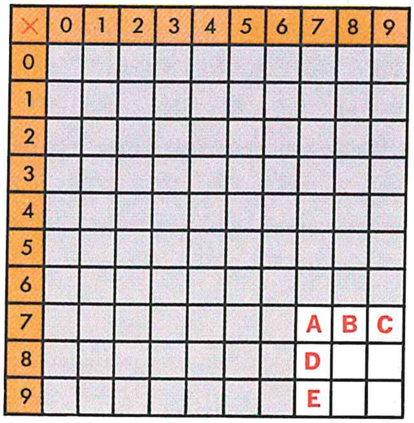
DISCUSSION EXERCISES

1. Explain how to use the products in the box to help find the products below.

$6 \times 7 = 42$	$10 \times 7 = 70$
$6 \times 8 = 48$	$4 \times 7 = 28$
$6 \times 9 = 54$	$3 \times 7 = 21$

[A] 7×7
[B] 7×8
[C] 7×9
[D] 8×7

2. Give the products for **A, B, C, D,** and **E.**



×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7								A	B	C
8								D		
9								E		

EXERCISES

1. Find the products.

[A] $$\left.\begin{array}{r}3 \times 5 = \boxed{n}\\ 4 \times 5 = \boxed{n}\end{array}\right\} 7 \times 5 = \boxed{n}$$

[B] $$\left.\begin{array}{r}3 \times 8 = \boxed{n}\\ 4 \times 8 = \boxed{n}\end{array}\right\} 7 \times 8 = \boxed{n}$$

[C] $$\left.\begin{array}{r}3 \times 6 = \boxed{n}\\ 4 \times 6 = \boxed{n}\end{array}\right\} 7 \times 6 = \boxed{n}$$

[D] $$\left.\begin{array}{r}6 \times 4 = \boxed{n}\\ 1 \times 4 = \boxed{n}\end{array}\right\} 7 \times 4 = \boxed{n}$$

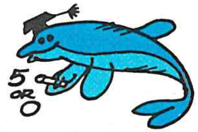
2. Find the products.

[A] $\begin{array}{r}3\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 3}\end{array}$
[B] $\begin{array}{r}6\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 6}\end{array}$

[C] $\begin{array}{r}5\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 5}\end{array}$
[D] $\begin{array}{r}8\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 8}\end{array}$

[E] $\begin{array}{r}9\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 9}\end{array}$
[F] $\begin{array}{r}4\\ \underline{\times 7}\end{array}$ $\begin{array}{r}7\\ \underline{\times 4}\end{array}$

Think



Whenever I'm a factor,
I think I'm quite a hero.
You'll always get a product
That ends in five or zero.

WHO AM I?

Using eight and nine as factors

At last! The end is here! In this lesson, you will study the last 4 of the basic multiplication facts. You may not have all the facts memorized by the end of this lesson, but you should be able to work out most of them on your own. As you move ahead you should continue toward the goal of remembering all the basic multiplication facts.

×	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8									A	B
9									C	D

DISCUSSION EXERCISES

1. [A] Explain how the fact 4 × 8 = 32 can be used to find 8 × 8.
   [B] What is the product for **A** in the table?

2. [A] How can the fact 7 × 9 = 63 be used to find 8 × 9?
   [B] What is the product for **B** in the table?

3. [A] Why is the product for **C** the same as the product for **B**?
   [B] What is the product for **C**?

4. [A] How can the fact 10 × 9 = 90 be used to find 9 × 9?
   [B] Find the product for **D** in the table.

EXERCISES

1. Find the products.

   [A] $4 \times 8 = \boxed{n} \longrightarrow 8 \times 8 = \boxed{n}$
   [B] $4 \times 9 = \boxed{n} \longrightarrow 8 \times 9 = \boxed{n}$

2. Find the products.

   [A] 8 × 0
   [B] 8 × 1
   [C] 8 × 2
   [D] 8 × 3
   [E] 8 × 4
   [F] 8 × 5
   [G] 8 × 6
   [H] 8 × 7
   [I] 8 × 8
   [J] 8 × 9
   [K] 9 × 0
   [L] 9 × 1
   [M] 9 × 2
   [N] 9 × 3
   [O] 9 × 4
   [P] 9 × 5
   [Q] 9 × 6
   [R] 9 × 7
   [S] 9 × 8
   [T] 9 × 9

Practice finding products

1. Find the products.

[A] 3 × 4
[B] 6 × 2
[C] 5 × 5
[D] 4 × 2
[E] 6 × 3
[F] 4 × 5
[G] 3 × 8
[H] 2 × 9
[I] 0 × 7
[J] 6 × 1
[K] 5 × 6
[L] 4 × 4
[M] 7 × 2
[N] 8 × 4
[O] 5 × 3
[P] 7 × 3
[Q] 7 × 8
[R] 9 × 5
[S] 8 × 8
[T] 6 × 7
[U] 8 × 7
[V] 6 × 6
[W] 9 × 7
[X] 9 × 9

Think

Multiply me by myself.
You're almost up to fifty.
Though I am a little odd,
I think I'm pretty nifty.

WHO AM I?

2. Find the products.

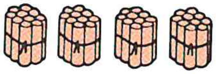
[A] $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$ [B] $\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$ [C] $\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$ [D] $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$ [E] $\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$ [F] $\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$ [G] $\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$ [H] $\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$

[I] $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$ [J] $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$ [K] $\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$ [L] $\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$ [M] $\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$ [N] $\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$ [O] $\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$ [P] $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$

[Q] $\begin{array}{r} 6 \\ \times 1 \\ \hline \end{array}$ [R] $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$ [S] $\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$ [T] $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$ [U] $\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$ [V] $\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$ [W] $\begin{array}{r} 0 \\ \times 7 \\ \hline \end{array}$ [X] $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$

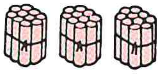
3. Complete the sentence. Then write the product.

[A]



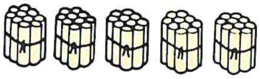
For 4 sets of ten,
we write ▨.
$4 \times 10 = \boxed{n}$

[B]



For 3 sets of ten,
we write ▨.
$3 \times 10 = \boxed{n}$

[C]



For 5 sets of ten,
we write ▨.
$5 \times 10 = \boxed{n}$

4. Solve the equations.

[A] 6 sets of ten
$6 \times 10 = \boxed{n}$

[B] 2 sets of ten
$2 \times 10 = \boxed{n}$

[C] 8 sets of ten
$8 \times 10 = \boxed{n}$

Short sport stories

1. 2 basketball teams.
   5 players on each team.
   How many players?

2. 2 basketball teams.
   4 cheerleaders for each team.
   How many cheerleaders?

3. Doubleheader baseball game. Each game 9 innings. How many innings?

4. Baseball game.
   6 outs each inning.
   9 innings.
   How many outs?

5. Red Sox.
   3 outs each inning.
   9 innings.
   How many outs?

6. Basketball game.
   4 quarters.
   8 minutes each quarter.
   How many minutes?

7. Bowling.
   Knock down 7 pins 4 times.
   1 point for each pin.
   How many points?

8. Tennis.
   Played 9 games and won 4.
   How many games lost?

9. Bowling.
   8 balls in each rack.
   7 racks.
   How many bowling balls?

10. Baseball.
    3 strikes, you're out.
    8 strikeouts.
    How many strikes?

11. Football game.
    6 points for a touchdown.
    5 touchdowns.
    How many points?

12. Football game.
    6 points for a touchdown.
    7 touchdowns. How many points?

13. Softball.
    9 players on each team.
    7 teams.
    How many players?

14. Basketball.
    5 fouls, you're out of the game.
    4 players out on fouls.
    How many fouls for these players?

15. Baseball game.
    4 innings, 0 runs each inning.
    How many runs?

★ 16. Football.
    6 points for a touchdown.
    Bulldogs scored 8 touchdowns and 4 extra points.
    What was their score?

Helping the forest ranger

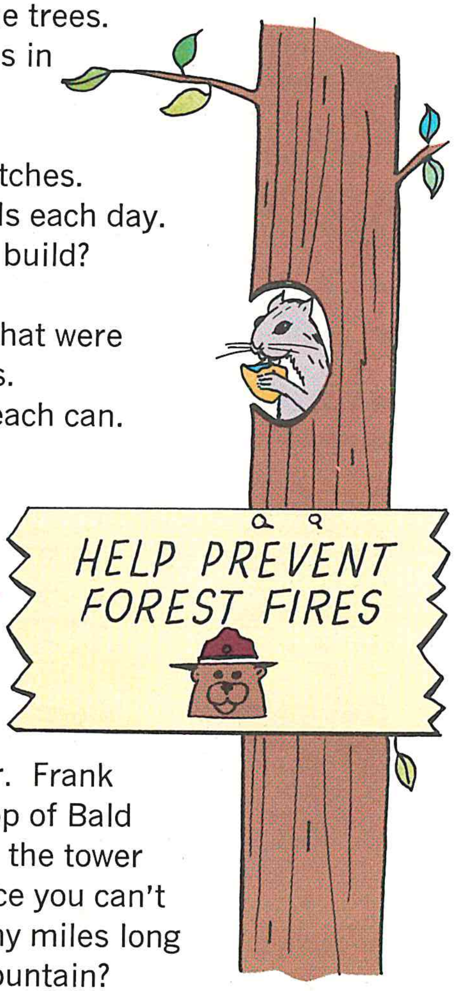
Last summer Frank spent a week with his Uncle Bill, who is a forest ranger.

1. Frank helped his uncle plant some small pine trees. Frank planted 3 rows of trees. He put 8 trees in each row. How many trees did he plant?

2. Frank learned how to build a fire without matches. Uncle Bill let Frank build the fires for 3 meals each day. Frank stayed 7 days. How many fires did he build?

3. One day Uncle Bill showed Frank some fish that were to be put in Blue Lake. The fish were in cans. Frank counted 9 cans. There were 8 fish in each can. How many fish were there in all?

4. On Tuesday, Frank helped Uncle Bill put signs on trees. They looked like this. They posted signs on trees along 4 different trails. They put 9 signs on each trail. How many signs did they post?



5. Uncle Bill took Frank to the fire lookout tower. Frank looked through the telescope at the flag on top of Bald Mountain. His uncle said, "It is 4 miles from the tower straight to the top of Bald Mountain. But since you can't fly, it is 5 times as far by the trail." How many miles long is the trail from the tower to the top of the mountain?

Finding missing factors

1. Copy each equation, giving the product for $\boxed{n}$.

[A] $3 \times 4 = \boxed{n}$
[B] $6 \times 3 = \boxed{n}$
[C] $4 \times 5 = \boxed{n}$
[D] $3 \times 7 = \boxed{n}$
[E] $4 \times 6 = \boxed{n}$
[F] $2 \times 9 = \boxed{n}$
[G] $5 \times 3 = \boxed{n}$
[H] $6 \times 5 = \boxed{n}$
[I] $5 \times 2 = \boxed{n}$
[J] $7 \times 1 = \boxed{n}$
[K] $0 \times 8 = \boxed{n}$
[L] $3 \times 8 = \boxed{n}$

2. Give the missing factors. If you need help, check your equations in exercise 1.

[A] $\boxed{n} \times 2 = 10$
[B] $7 \times \boxed{n} = 7$
[C] $6 \times \boxed{n} = 18$
[D] $\boxed{n} \times 5 = 30$
[E] $3 \times \boxed{n} = 12$
[F] $4 \times \boxed{n} = 20$
[G] $\boxed{n} \times 9 = 18$
[H] $5 \times \boxed{n} = 15$
[I] $\boxed{n} \times 7 = 21$
[J] $\boxed{n} \times 8 = 0$
[K] $\boxed{n} \times 8 = 24$
[L] $\boxed{n} \times 6 = 24$

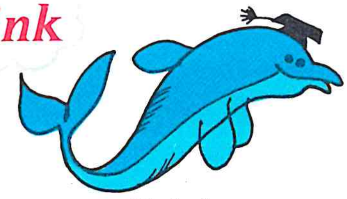
3. Draw a set of 12 dots on your paper. Ring sets of 3 to find how many threes in 12. Write a multiplication equation about this.

4. Draw a set of 20 dots on your paper. Ring sets of 4 to find how many fours in 20. Write a multiplication equation about this.

5. Find the missing factors.

[A] $3 \times \boxed{n} = 9$
[B] $2 \times \boxed{n} = 6$
[C] $\boxed{n} \times 4 = 16$
[D] $\boxed{n} \times 1 = 7$
[E] $2 \times \boxed{n} = 10$
[F] $\boxed{n} \times 5 = 15$
[G] $\boxed{n} \times 9 = 0$
[H] $2 \times \boxed{n} = 4$
[I] $3 \times \boxed{n} = 6$
[J] $\boxed{n} \times 5 = 25$
[K] $4 \times \boxed{n} = 4$
[L] $\boxed{n} \times 3 = 12$
[M] $\boxed{n} \times 6 = 12$
[N] $\boxed{n} \times 1 = 1$
[O] $4 \times \boxed{n} = 12$
[P] $2 \times \boxed{n} = 14$
[Q] $\boxed{n} \times 5 = 10$
[R] $7 \times \boxed{n} = 0$
[S] $3 \times \boxed{n} = 15$
[T] $\boxed{n} \times 2 = 8$
[U] $\boxed{n} \times 2 = 12$
[V] $9 \times \boxed{n} = 9$
[W] $9 \times \boxed{n} = 18$
[X] $4 \times \boxed{n} = 0$

Think



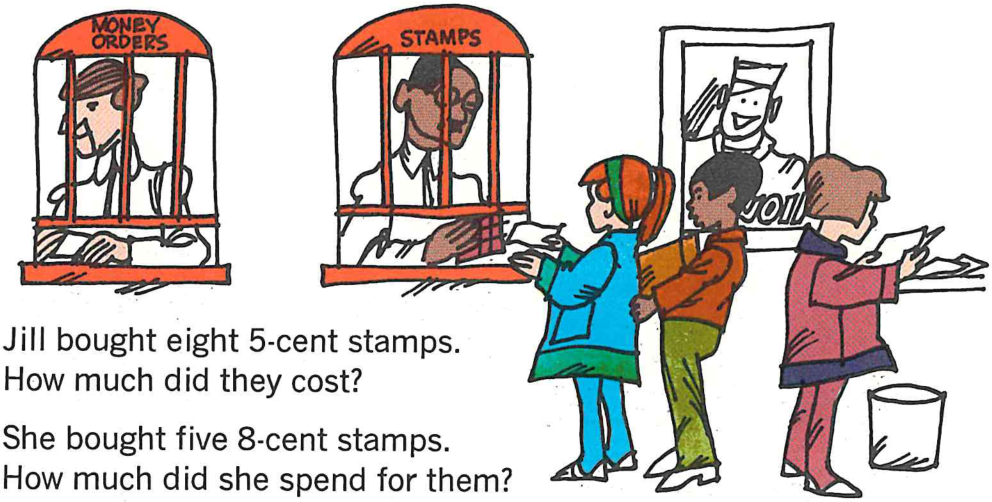
When you multiply by me,
I really am quite tame.
No matter what the factor is,
The product stays the same.

WHO AM I?

6. Find the missing factors.

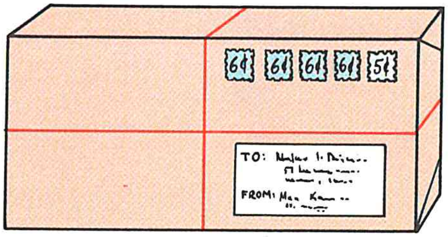
[A] $\begin{array}{r} \square \\ \times 2 \\ \hline 6 \end{array}$
[B] $\begin{array}{r} \square \\ \times 3 \\ \hline 12 \end{array}$
[C] $\begin{array}{r} 3 \\ \times \square \\ \hline 9 \end{array}$
[D] $\begin{array}{r} 2 \\ \times \square \\ \hline 4 \end{array}$
[E] $\begin{array}{r} \square \\ \times 2 \\ \hline 8 \end{array}$
[F] $\begin{array}{r} 5 \\ \times \square \\ \hline 10 \end{array}$
[G] $\begin{array}{r} 4 \\ \times \square \\ \hline 0 \end{array}$
[H] $\begin{array}{r} \square \\ \times 1 \\ \hline 7 \end{array}$
[I] $\begin{array}{r} 4 \\ \times \square \\ \hline 8 \end{array}$
[J] $\begin{array}{r} 4 \\ \times \square \\ \hline 12 \end{array}$
[K] $\begin{array}{r} \square \\ \times 5 \\ \hline 15 \end{array}$
[L] $\begin{array}{r} \square \\ \times 2 \\ \hline 18 \end{array}$
[M] $\begin{array}{r} 1 \\ \times \square \\ \hline 9 \end{array}$
[N] $\begin{array}{r} \square \\ \times 5 \\ \hline 25 \end{array}$
[O] $\begin{array}{r} \square \\ \times 7 \\ \hline 0 \end{array}$
[P] $\begin{array}{r} 4 \\ \times \square \\ \hline 16 \end{array}$

At the post office



1. Jill bought eight 5-cent stamps. How much did they cost?
2. She bought five 8-cent stamps. How much did she spend for them?
3. Jill saw some 1-cent stamps. She counted 3 rows and 9 stamps in each row. How many 1-cent stamps did she see?
4. 5-cent stamps come to the post office in sheets with 10 rows and 10 columns. How many stamps are in each sheet?
5. Jill bought 24 airmail stamps. She bought 4 times as many as Kay. How many airmail stamps did Kay buy?
6. Kay pasted 15 stamps in her collection book. She had 5 rows. How many were there in each row?
7. Which costs more, nine 5-cent stamps or seven 6-cent stamps?
8. Jan spent 32 cents for 8-cent stamps. How many stamps did she buy?

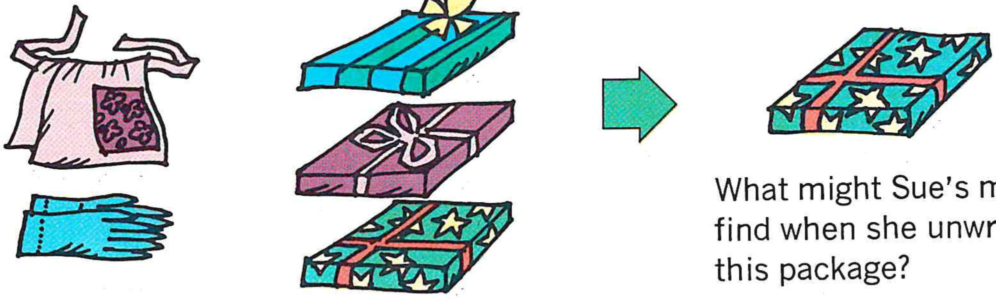
★ 9. Bill needed 29 cents worth of stamps to mail his package. He had only 5-cent, 6-cent, 7-cent, and 8-cent stamps. He wanted to use only **2 different kinds** of stamps. One way to stamp the package is given in the picture.



[A] Find another way, using 7-cent and 8-cent stamps.
[B] Find another way, using 5-cent and 8-cent stamps.
[C] Find another way.

Multiplication and pairing

Sue is getting her mother a birthday present. She will get her an apron or gloves. She will put the gift in one of the 3 boxes shown below.



What might Sue's mother find when she unwraps this package?

DISCUSSION EXERCISES

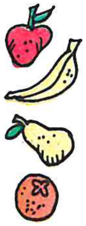
1. Which of the two gifts would you choose?
2. Which of the 3 boxes would you choose for the gift?
3. Sue finally decided to get the gloves. She put them in the box with the stars. What would your choices have been? Give as many different choices as you can.
4. Solve: Number of gifts to choose from Number of boxes to choose from Number of different choices possible

$$\overset{\text{Number of gifts to choose from}}{2} \times \overset{\text{Number of boxes to choose from}}{3} = \overset{\text{Number of different choices possible}}{n}$$

EXERCISES

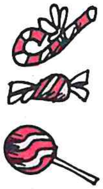
1. You can have one piece of fruit.

Apple
Banana
Pear
Orange

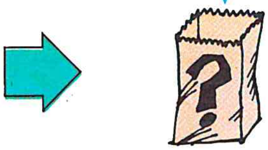


You can have one piece of candy.

Candycane
Kiss
Lollipop



One of each.



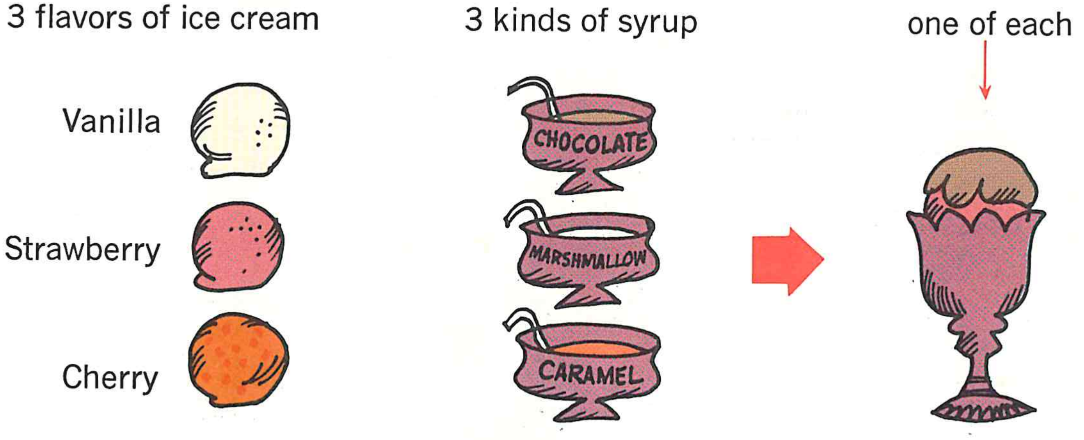
[A] How many different pieces of fruit are there?

[B] How many different pieces of candy are there?

[C] Name all the possible choices that could be in the sack. Use the red letters to stand for each object.

[D] Solve: $4 \times 3 = \boxed{n}$

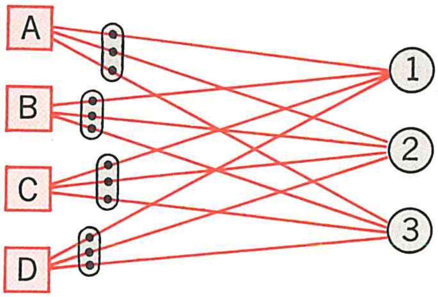
2. 3 flavors of ice cream



[A] How many different sundaes can you make? List them.

[B] Solve: $3 \times 3 = \boxed{n}$

3. Here is a pairing of a set of squares with a set of circles. The small dots help you count the red lines.

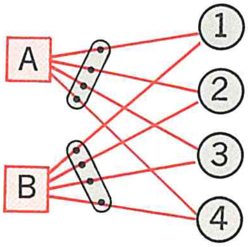


When you look at the small dots, you see 4 sets of 3. For each square there are 3 small dots.

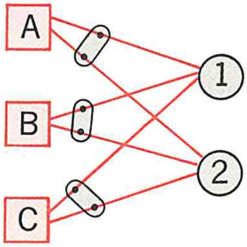
We think: $4 \times 3 = 12$

Think about the sets of small dots. Then write a multiplication equation for each picture.

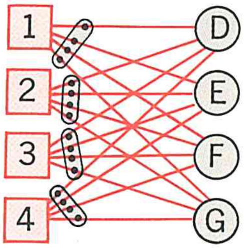
[A]



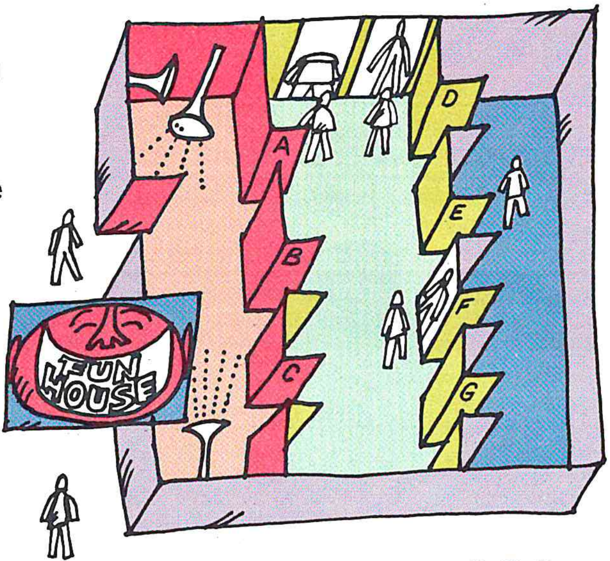
[B]



[C]



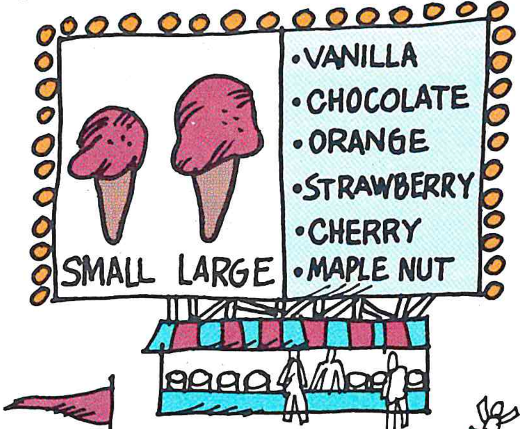
At the carnival



1. In the Fun House, there are 3 doors (A, B, and C) leading from the Noise Room to the Mirror Room. There are 4 doors (D, E, F, and G) leading from the Mirror Room to the Dark Room.

[**A**] There are 12 ways to get from the Noise Room to the Dark Room. See if you can find them all.

[**B**] Write a multiplication equation about this.



2. There are 2 sizes of ice cream cones. There are 6 flavors to choose from.

[**A**] How many different ice cream cones could you buy?

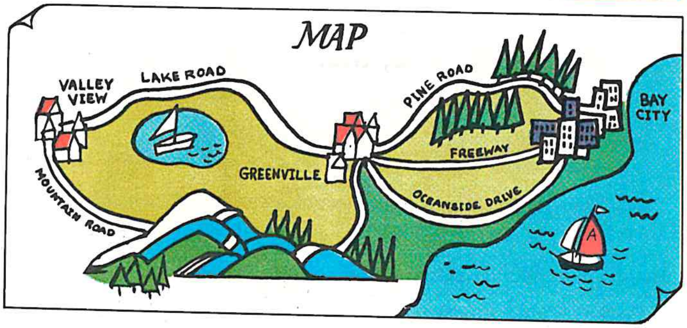
[**B**] Write a multiplication equation about this.

★ **3.** Bob had 2 tickets for rides. There were 4 things he could ride: the merry-go-round, ferris wheel, airplanes, roller coaster.

[**A**] Give all the ways Bob could use his 2 tickets. There are 16 ways.

[**B**] Write a multiplication equation about this.

Planning a trip

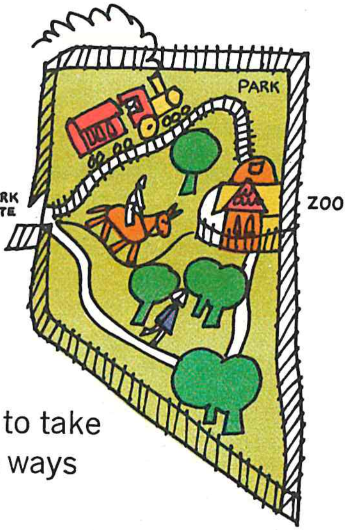


1. Stuart lives in Valley View. When he was helping plan a family trip to Bay City, he thought about these questions. See if you can answer them.
   - [A] In how many ways can we drive from Valley View to Greenville?
   - [B] In how many ways can we drive from Greenville to Bay City?
   - [C] What are the 6 ways to drive from Valley View to Bay City?
   - [D] What multiplication equation can we write about these ideas?

2. Stuart and his sister made plans for the day in Bay City. Here is the list of things they wanted to do.
   - [A] How many afternoon choices are on the list?
   - [B] How many evening choices are on the list?
   - [C] Use the list to give all the possible ways they could spend the day. (You should find 8 ways.)
   - [D] Write a multiplication equation about these ideas.

Trip

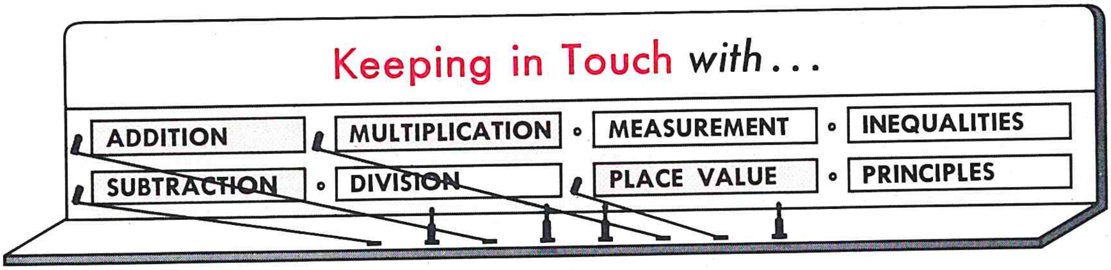
Afternoon Fun	Evening Fun
We could go to the *museum* or the *airport* or the *amusement park* or the *zoo*	We could go to the *movie* or the *basketball game*



3. Stuart and his family can take the **helicopter,** the **boat,** or the **bus** from the restaurant to the park gate.

   To get from the gate to the zoo, they can ride the small **train,** ride the **pony,** or **walk.**
   - [A] Stuart wanted to take the boat from the restaurant to the park gate and then take the train from the gate to the zoo. Brenda wanted to take the helicopter and then the pony. Find 7 more ways to get from the restaurant to the zoo.
   - [B] How many ways can they go from the restaurant to the zoo?
   - [C] Write a multiplication equation about these ideas.

Keeping in Touch *with . . .*



1. Find the sums.

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
3 +9	8 +3	5 +7	7 +7	8 +5	4 +9	4 +7	9 +6

[I]	[J]	[K]	[L]	[M]	[N]	[O]	[P]
7 +8	8 +9	6 +8	9 +5	7 +9	9 +9	8 +8	7 +6

2. Find the differences.

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
11 −9	12 −8	16 −7	11 −8	12 −3	13 −8	14 −9	14 −7

[I]	[J]	[K]	[L]	[M]	[N]	[O]	[P]
11 −6	17 −8	13 −7	12 −5	15 −7	16 −8	18 −9	15 −9

3. Find the sums.

[A]	[B]	[C]	[D]	[E]	[F]
62 +23	35 +24	16 +51	328 +160	457 +132	615 +204

4. Find the differences.

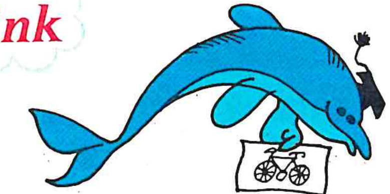
[A]	[B]	[C]
89 −23	68 −51	586 −212

5. Find the sums.

[A]	[B]	[C]
38 +27	65 +25	73 +18

[D]	[E]	[F]
75 +86	38 +95	67 +67

Think



The product is even
When I multiply.
On words like bicycle,
My nickname is "bi."

WHO AM I?

6. Find the differences.

[A] $\begin{array}{r} 36 \\ -17 \\ \hline \end{array}$ [B] $\begin{array}{r} 43 \\ -24 \\ \hline \end{array}$ [C] $\begin{array}{r} 52 \\ -17 \\ \hline \end{array}$ [D] $\begin{array}{r} 58 \\ -29 \\ \hline \end{array}$ [E] $\begin{array}{r} 64 \\ -27 \\ \hline \end{array}$ [F] $\begin{array}{r} 80 \\ -68 \\ \hline \end{array}$

[G] $\begin{array}{r} 123 \\ -47 \\ \hline \end{array}$ [H] $\begin{array}{r} 144 \\ -58 \\ \hline \end{array}$ [I] $\begin{array}{r} 163 \\ -76 \\ \hline \end{array}$ [J] $\begin{array}{r} 150 \\ -68 \\ \hline \end{array}$ [K] $\begin{array}{r} 131 \\ -75 \\ \hline \end{array}$ [L] $\begin{array}{r} 155 \\ -67 \\ \hline \end{array}$

7. Find the sums.

[A] $40 + 2$
[B] $30 + 7$
[C] $70 + 3$
[D] $60 + 9$
[E] $10 + 8$
[F] $200 + 40 + 7$
[G] $500 + 80 + 9$
[H] $600 + 10 + 4$
[I] $900 + 2$
[J] $500 + 40$
[K] $2 + 30 + 600$
[L] $40 + 200 + 3$
[M] $900 + 8 + 60$
[N] $7 + 400 + 30$
[O] $90 + 2 + 800$
[P] $9 + 900 + 90$

8. Find the sums.

[A] $3000 + 600 + 20 + 8$
[B] $4000 + 200 + 80 + 9$
[C] $200 + 6 + 4000 + 30$
[D] $50 + 6000 + 200 + 6$

9. Study the example. Then write each number as shown in the example.

Example: $8295 = 8000 + 200 + 90 + 5$

[A] 654
[B] 892
[C] 528
[D] 4347
[E] 8126
[F] 5384
[G] 87,265
[H] 27,615
[I] 834,765

Think

If you add me to myself
Then multiply by two,
It's 12 plus 4 you're
sure to get.
You need no other clue.

WHO AM I?

10. Find the sums and differences.

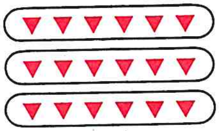
[A] $\begin{array}{r} \square 4 \\ +2\square \\ \hline 97 \end{array}$ [B] $\begin{array}{r} \square\square \\ -27 \\ \hline 12 \end{array}$ [C] $\begin{array}{r} 36 \\ +\square\square \\ \hline 61 \end{array}$ [D] $\begin{array}{r} \square 3 \\ -36 \\ \hline 5\square \end{array}$ [E] $\begin{array}{r} 84 \\ -3\square \\ \hline \square 7 \end{array}$

[F] $\begin{array}{r} \square 4\square \\ -237 \\ \hline 6\square 2 \end{array}$ [G] $\begin{array}{r} 885 \\ -\square 3\square \\ \hline 2\square 2 \end{array}$ [H] $\begin{array}{r} 63\square \\ -207 \\ \hline \square\square 8 \end{array}$ [I] $\begin{array}{r} 5\square 7 \\ +\square 9\square \\ \hline 733 \end{array}$ [J] $\begin{array}{r} 8\square 6 \\ -339 \\ \hline \square 1\square \end{array}$

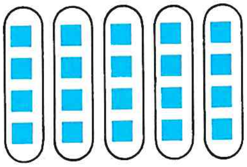
Chapter review

1. Write multiplication equations for each exercise.

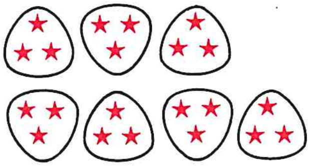
[A]



[B]



[C]



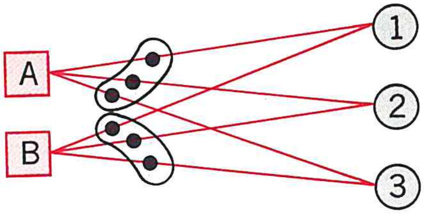
[D] $5 + 5 + 5 + 5 + 5 + 5$

[E] $8 + 8 + 8 + 8$

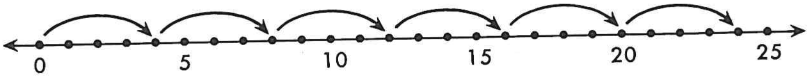
[F] $4 + 4 + 4 + 4 + 4 + 4 + 4$

[G] $2 + 2 + 2 + 2 + 2$

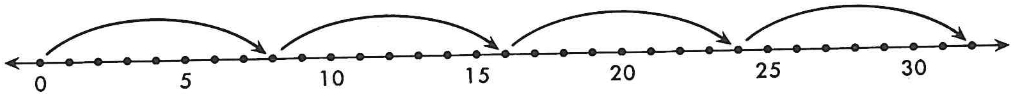
[H]



[I]



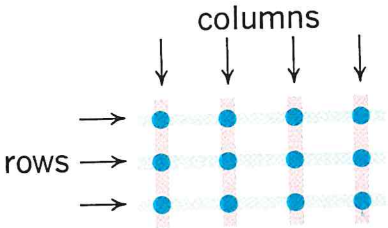
[J]



2. Write a multiplication equation about this set by

[A] thinking about the rows.

[B] thinking about the columns.



3. Find the missing factors.

[A] $6 \times 7 = \boxed{n} \times 6$

[B] $9 \times 8 = 8 \times \boxed{n}$

[C] $27 \times 56 = \boxed{n} \times 27$

[D] $98 \times 76 = 76 \times \boxed{n}$

4. Complete each statement.

[A] The product of any number and one is ___?___.

[B] The product of any number and zero is ___?___.

5. Solve the equations.

[A] $5 \times 4 = (3 \times 4) + (\boxed{n} \times 4)$

[B] $8 \times 3 = (4 \times 3) + (\boxed{n} \times 3)$

[C] $7 \times 5 = (6 \times 5) + (\boxed{n} \times 5)$

5. Find the products.

[A] 6×0
[B] 1×8
[C] 5×3
[D] 2×6
[E] 0×9
[F] 5×5
[G] 7×1
[H] 4×3

[I] 2×7
[J] 5×4
[K] 2×5
[L] 5×6
[M] 2×9
[N] 5×7
[O] 2×8
[P] 6×2

[Q] Since $9 \times 6 = 54$, we know that $6 \times 9 = \boxed{n}$.
[R] Since $6 \times 7 = 42$, we know that $7 \times 6 = \boxed{n}$.
[S] Since $8 \times 6 = 48$, we know that $6 \times 8 = \boxed{n}$.
[T] Since $9 \times 8 = 72$, we know that $8 \times 9 = \boxed{n}$.
[U] Since $5 \times 5 = 25$, we know that $6 \times 5 = \boxed{n}$.
[V] Since $6 \times 6 = 36$, we know that $7 \times 6 = \boxed{n}$.
[W] Since $7 \times 7 = 49$, we know that $8 \times 7 = \boxed{n}$.
[X] Since $8 \times 8 = 64$, we know that $9 \times 8 = \boxed{n}$.

6. Find the products.

[A] 3×3
[B] 7×8
[C] 3×4
[D] 6×7

[E] 4×5
[F] 7×7
[G] 3×9
[H] 8×8

[I] 4×7
[J] 6×8
[K] 5×8
[L] 4×4

[M] 3×8
[N] 4×9
[O] 3×6
[P] 6×6

[Q] 4×6
[R] 7×9
[S] 3×5
[T] 9×9

[U] 6×9
[V] 3×7
[W] 4×8
[X] 8×9

7. Complete the sentence.
Then find the product.

[A] For 3 sets of 10, we write ▥.
$3 \times 10 = \boxed{n}$

[B] For 5 sets of 10, we write ▥.
$5 \times 10 = \boxed{n}$

[C] For 8 sets of 10, we write ▥.
$8 \times 10 = \boxed{n}$

[D] For 7 sets of 10, we write ▥.
$7 \times 10 = \boxed{n}$

[E] For 9 sets of 10, we write ▥.
$9 \times 10 = \boxed{n}$

Think

If it's products you must find,
You'll think I'm quite a guy.
I don't cause a single change
When I just multiply.

WHO AM I?

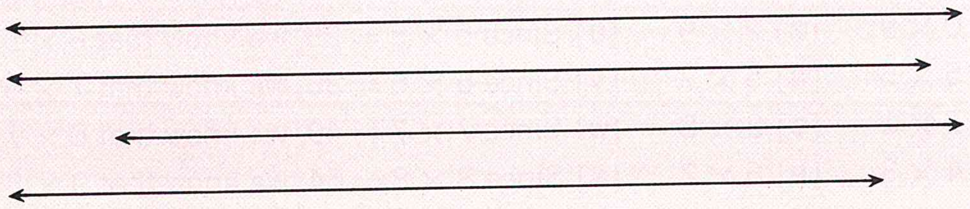
8. Solve the equations.

[A] $(2 \times 7) + (3 \times 7) = \boxed{n}$
[B] $(4 \times 8) + (1 \times 8) = \boxed{n}$
[C] $(8 \times 7) + (2 \times 7) = \boxed{n}$
[D] $(5 \times 9) + (5 \times 9) = \boxed{n}$

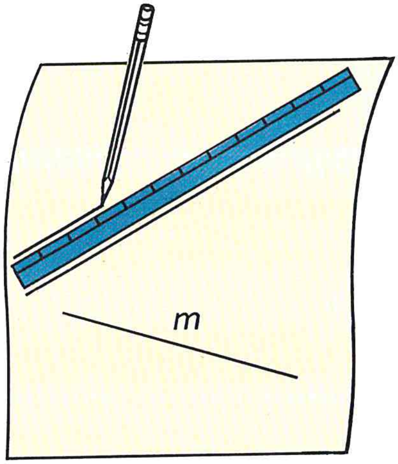
[E] $(6 \times 8) + (4 \times 8) = \boxed{n}$
[F] $(7 \times 7) + (3 \times 7) = \boxed{n}$
[G] $(9 \times 8) + (1 \times 8) = \boxed{n}$
[H] $(4 \times 9) + (6 \times 9) = \boxed{n}$

GEOMETRY Unit 2

Parallel lines



PARALLEL LINES



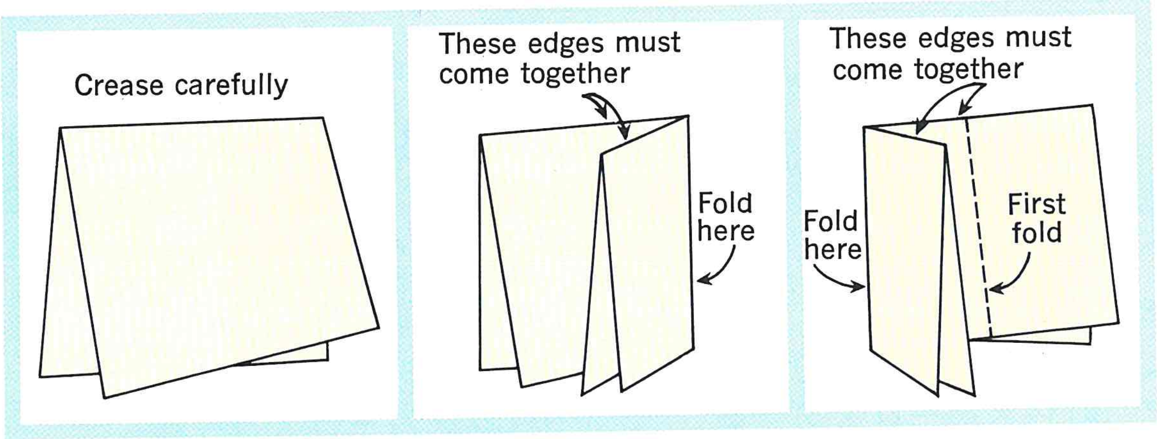
In this lesson, you will learn some ways to draw parallel lines.

1. You can draw a pair of parallel lines by drawing on each side of your ruler.

[A] Draw some parallel lines using this method.

[B] Would you say that line *m* in the picture is parallel to the lines by the ruler?

2. Here is a way to get parallel lines by folding paper. Follow these directions.


Crease carefully
These edges must come together
Fold here
These edges must come together
Fold here
First fold

Open your paper and use the folds to draw parallel lines. Try to find other ways of getting parallel lines by folding paper.

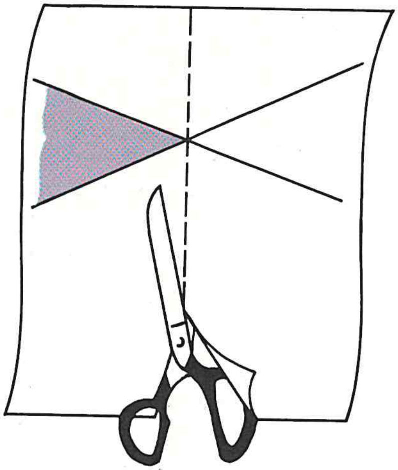
3. Here is a way to use angles to get parallel lines.

[A] Draw two lines that cross each other.

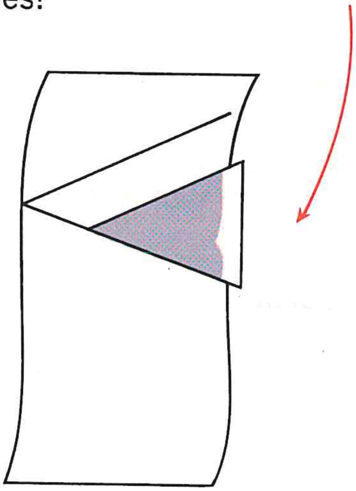
[B] Color the inside of one angle red.

[C] Cut your paper as shown in the picture.

[D] Cut out the angle you colored.



[E] Place the angle you colored along one side of the other angle. Do you see some parallel lines?

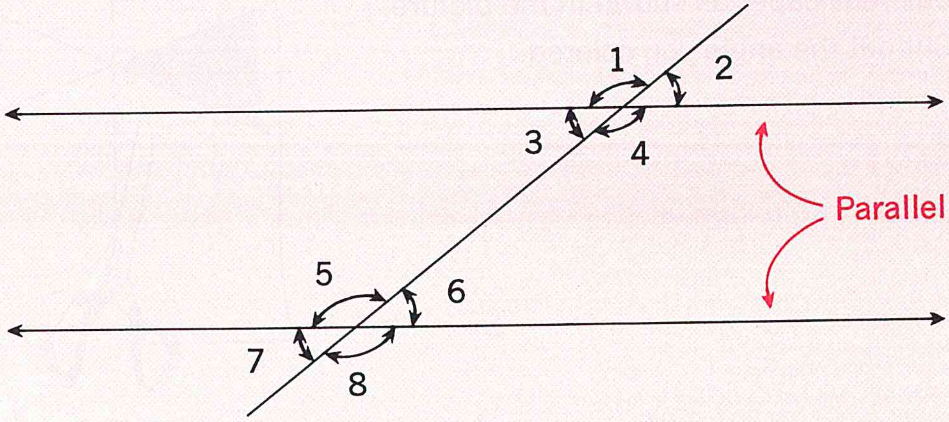


[F] Draw several different lines that are parallel to one side of the angle.

[G] Try to find a different way of placing the angle to get parallel lines.

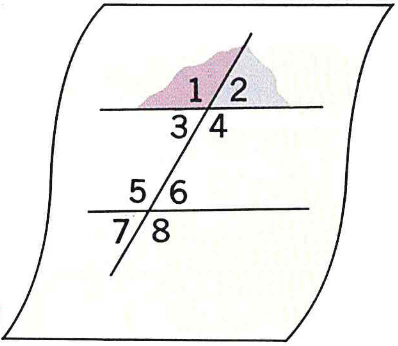
4. Tell what you think parallel lines are.

Angles and parallel lines



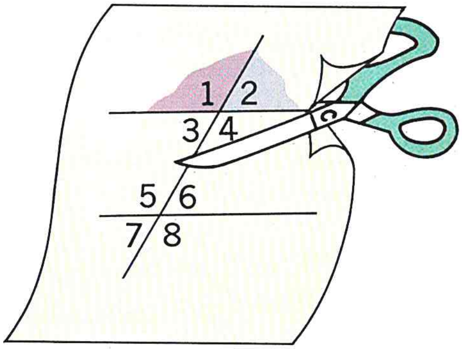
PARALLEL LINES CUT BY A THIRD LINE

In this lesson, you will learn some interesting relations between the 8 angles formed when 2 parallel lines are cut by a third line.



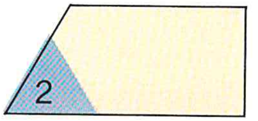
1. Draw 2 parallel lines. Draw a third line that cuts the 2 parallel lines. Number the angles as in the figure.

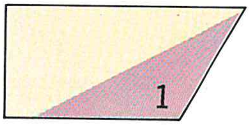
   Color the inside of angles 1 and 2 different colors.



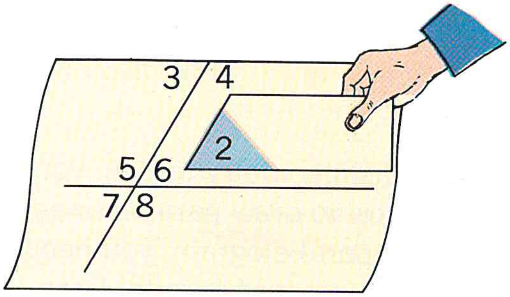
2. Cut your paper along the top parallel line.

3. Take the colored part of your paper and cut along the third line. You now have angle 1 and angle 2 cut out.

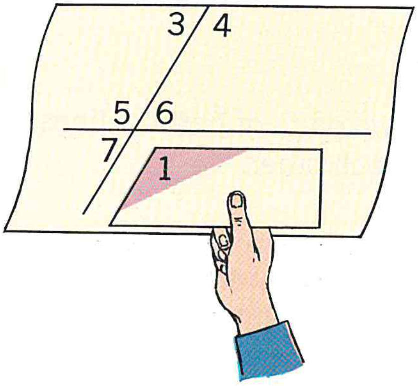




4. Which of the other angles (3, 4, 5, 6, 7, or 8) are the same size as angle 2? Use angle 2 to help you find out.



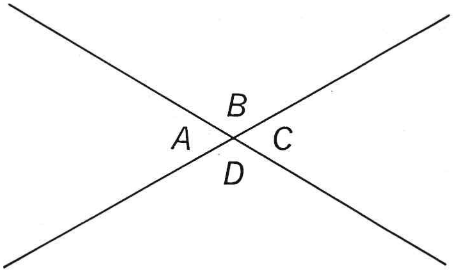
5. Which of the other angles are the same size as angle 1? Use angle 1 to help you find out.



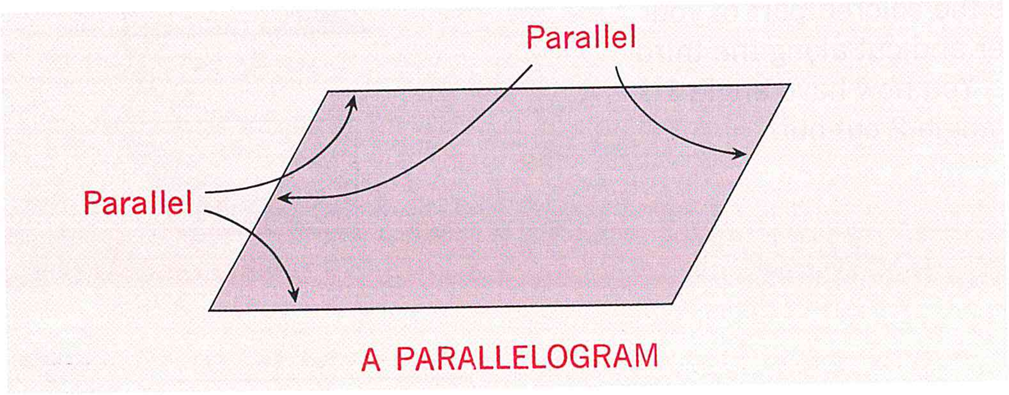
6. Draw a pair of lines that cross each other.
Letter the angles as in the figure.

[A] Which angle is the same size as angle *A*?

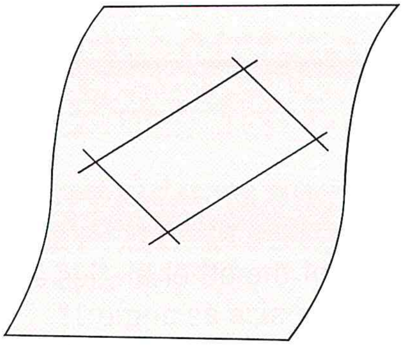
[B] Which angle is the same size as angle *B*?



Parallelograms



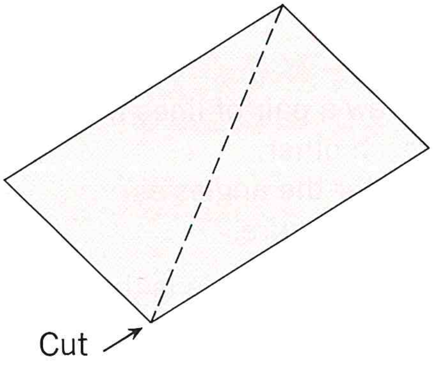
A PARALLELOGRAM



In the last geometry lesson, you learned how to draw parallel lines. To draw a parallelogram, you need to draw two pairs of parallel lines that intersect.

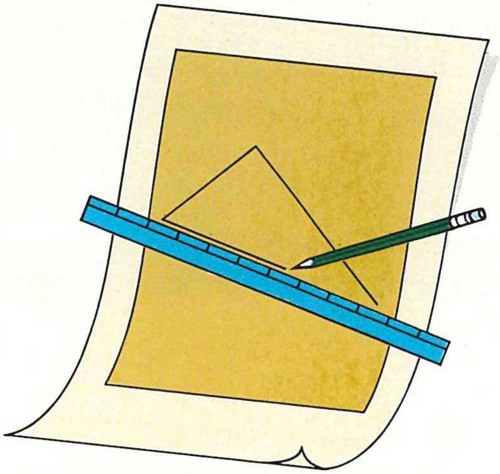
1. Draw two pairs of parallel lines that cross each other.

[A] Color the inside of your parallelogram and cut it out.

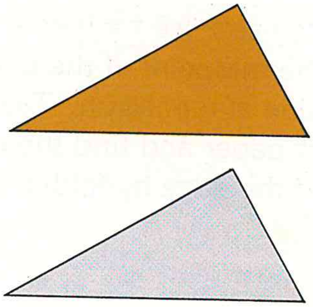


[B] Use your ruler to connect opposite corners. Then cut along the line. If you did your work carefully, the two triangles should fit upon each other.

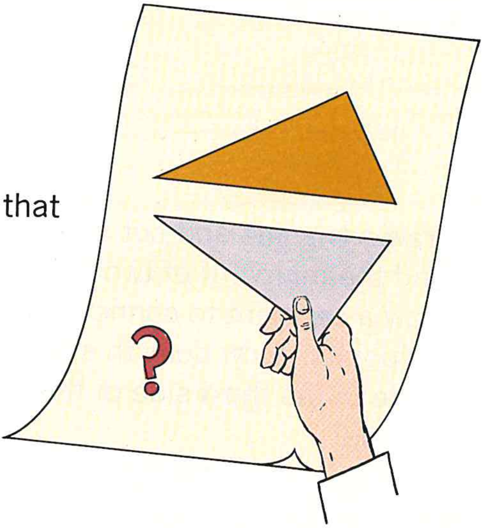
2. [**A**] Draw a triangle. Place a sheet of paper over your triangle and trace it carefully.



[**B**] Color the inside of the two triangles different colors. Cut them out. They should be just alike except for color.

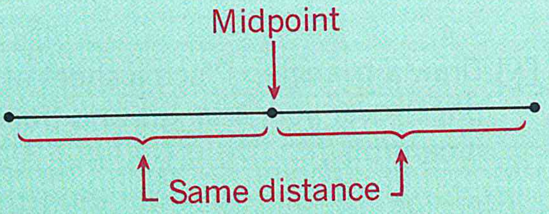


[**C**] Paste one of the triangles on another sheet of paper. Now try to paste the other triangle next to the first one so that the two triangles together form a parallelogram.

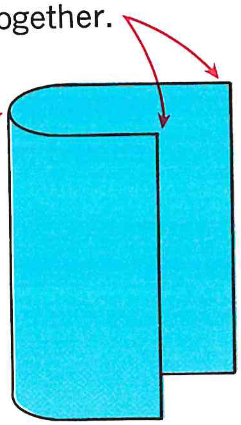


More about parallels

In this lesson, you will learn how to use midpoints to find lines that are parallel to other lines.



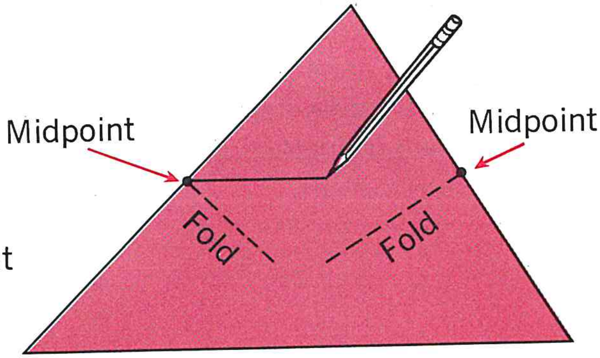
1. You can use folding to find the midpoint of the edge or side of a polygon. Take a sheet of paper and find the midpoint of the edge by folding.



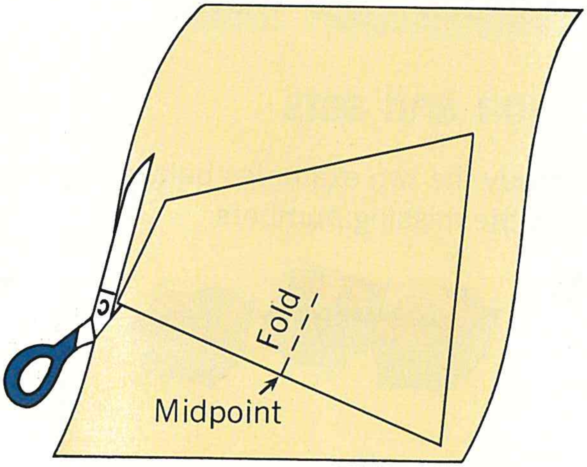
Be sure these two corners come together.

Then fold here to find the midpoint of the side.

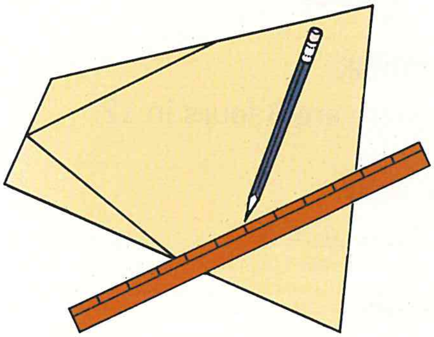
2. Draw a triangle and cut it out. Find the midpoint of two sides. Draw a segment to connect these midpoints. How does this segment relate to the third side of the triangle?



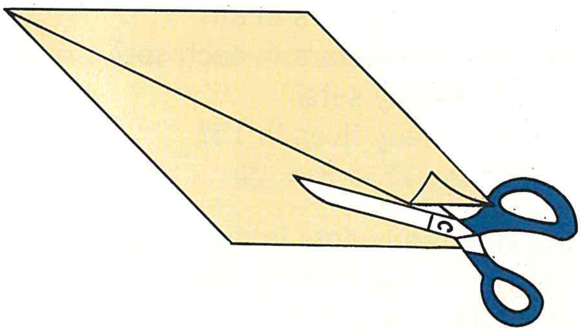
3. Draw a large 4-sided figure on your paper.
   - [A] Cut it out.
   - [B] Find the midpoint of each side by folding.



4. [A] Connect the midpoints with segments as in the figure.
   - [B] What kind of a figure do you think you have?
   - [C] Do you think this would work if you started over with a different 4-sided figure?



5. To "prove" you have a parallelogram, you can cut it out and then cut it into two triangles. If these triangles fit upon each other you have a parallelogram.

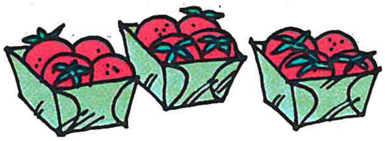


CHAPTER 5 Division

Division and sets

Study the two examples below. They will help you understand division. Give the missing numbers.

A



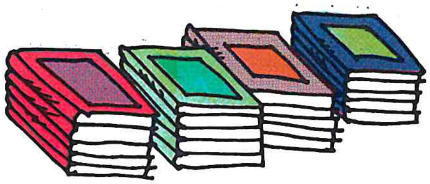
We see
12 tomatoes.
4 in each box.
3 boxes.

We think
there are 3 fours in 12.

We write
$12 \div 4 = 3$.

We say
12 divided by 4 equals ▒.

B



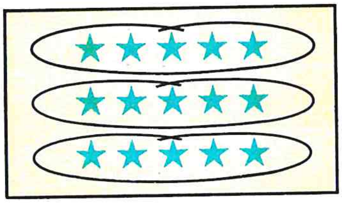
We see
20 books.
5 in each stack.
4 stacks.

We think
there are 4 fives in 20.

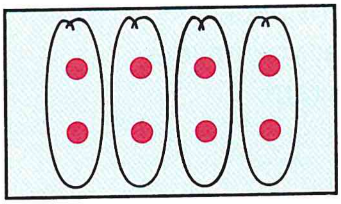
We write
$20 \div 5 = 4$.

We say
20 divided by 5 equals ▒.

EXERCISES

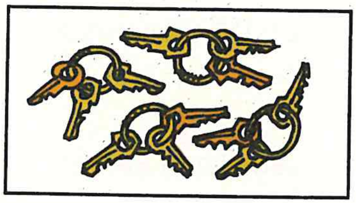


1. [A] How many stars in all?
[B] How many stars in each set?
[C] How many sets?
[D] How many fives in 15?
[E] Solve: $15 \div 5 = \boxed{n}$

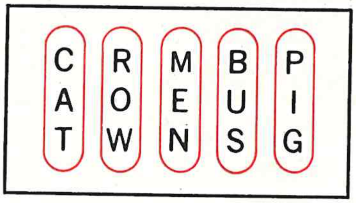


2. [A] How many dots in all?
[B] How many dots in each set?
[C] How many sets?
[D] How many twos in 8?
[E] Solve: $8 \div 2 = \boxed{n}$

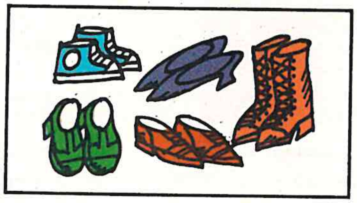
3. [A] How many keys in all?
[B] How many on each ring?
[C] How many rings?
[D] How many threes in 12?
[E] Solve: $12 \div 3 = \boxed{n}$



4. [A] How many letters in all?
[B] How many in each set?
[C] How many sets?
[D] How many threes in 15?
[E] Solve: $15 \div 3 = \boxed{n}$



5. [A] How many shoes in all?
[B] How many in each pair?
[C] How many pairs?
[D] How many twos in 10?
[E] Solve: $10 \div 2 = \boxed{n}$



When you solved the equations above, you found the **quotient.**

6. Draw 21 dots. Ring as many sets of 3 as you can.
[A] How many sets of 3 did you find?
[B] How many threes in 21?
[C] Find the quotient: $21 \div 3 = \boxed{n}$

7. Draw 24 dots. Ring as many sets of 4 as you can.
[A] How many sets of 4 did you ring?
[B] How many fours in 24?
[C] Find the quotient: $24 \div 4 = \boxed{n}$

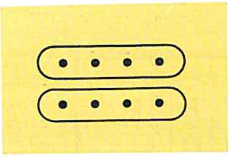
8. Draw 14 dots. Ring as many sets of 2 as you can.
[A] How many sets of 2 did you ring?
[B] How many twos in 14?
[C] Find the quotient: $14 \div 2 = \boxed{n}$

Understanding division

EXERCISES

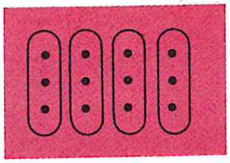
1. Look at the set. Then answer the question.

[A]



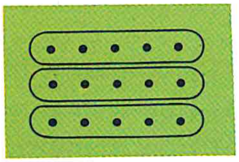
How many sets of 4 are in a set of 8?

[B]



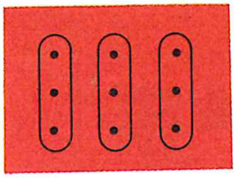
How many sets of 3 are in a set of 12?

[C]



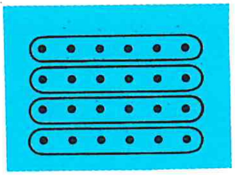
How many sets of 5 are in a set of 15?

[D]



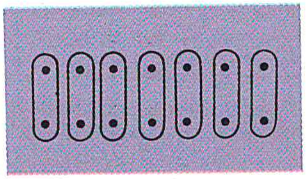
How many threes are in 9?

[E]



How many sixes are in 24?

[F]

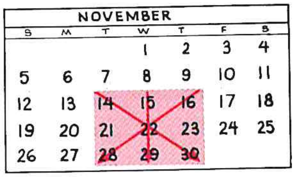


How many twos are in 14?

2. Solve the equations. Your work in exercise 1 should help you.

[A] $8 \div 4 = \boxed{n}$
[B] $12 \div 3 = \boxed{n}$
[C] $15 \div 5 = \boxed{n}$
[D] $9 \div 3 = \boxed{n}$
[E] $24 \div 6 = \boxed{n}$
[F] $14 \div 2 = \boxed{n}$

Think



NOVEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

1. Find the sum along each arrow.
2. Try this with any 3-by-3 square on any calendar.

3. Write a division equation to answer the question.

[A] How many sixes in 18?
(Answer: $18 \div 6 = 3$)
[B] How many fours in 12?
[C] How many twos in 12?
[D] How many threes in 24?
[E] How many twos in 10?
[F] How many fours in 16?
[G] How many fives in 20?
[H] How many threes in 27?
[I] How many fives in 30?
[J] How many sixes in 30?
[K] How many fours in 24?
[L] How many twos in 18?
[M] How many threes in 15?

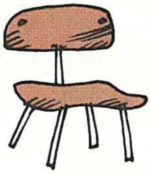
Short stories

1. 15 chocolates.
3 in each row.
How many rows?

2. 12 cookies.
2 for each child.
How many children?

3. 20 boys.
5 on a team.
How many teams?

4. 60 chairs.
10 in each row.
How many rows?



5. 18 letters.
3 in each word.
How many words?

6. 24 books.
6 in each stack.
How many stacks?

7. 70 pencils.
10 in a box.
How many boxes?

8. 18 children.
6 at a table.
How many tables?

9. 15 marbles.
5 in a sack.
How many sacks?

10. 14 slices of bread.
2 slices per sandwich.
How many sandwiches?

11. 16 white rats.
4 per cage.
How many cages?

12. 12-foot board.
Sawed into 3-foot pieces.
How many pieces?

13. 30 bottles of pop.
6 bottles in a carton.
How many cartons?

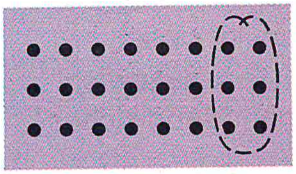
14. 25 pounds of sugar.
Put in 5 pound bags.
How many bags?

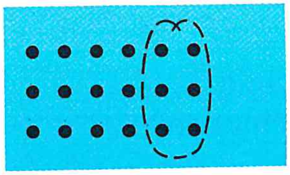
15. Write a division equation
for each exercise above.

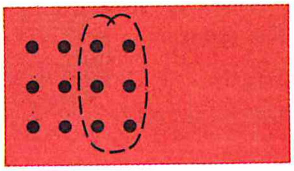
Division and subtraction

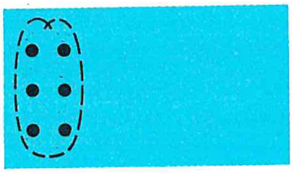
EXERCISES

1. Think about removing the dots in the ring.
Then solve the subtraction equations.

[A]

$24 - 6 = \boxed{n}$

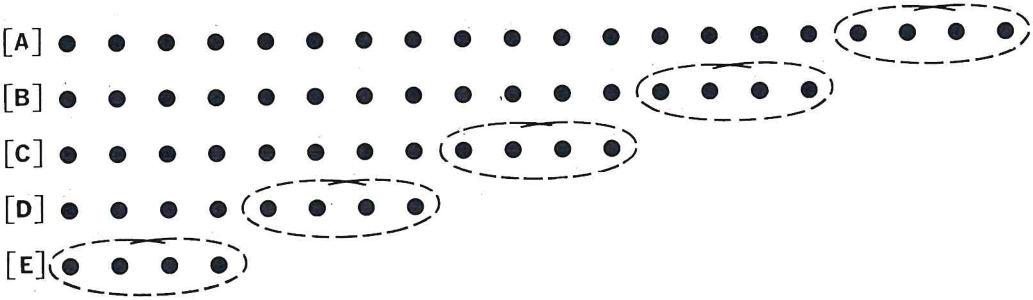
[B]

$18 - 6 = \boxed{n}$

[C]

$12 - 6 = \boxed{n}$

[D]

$6 - 6 = \boxed{n}$

2. [A] Study exercise 1 and tell how many sixes are in 24.
[B] Solve this equation. $24 \div 6 = \boxed{n}$

3. Write a subtraction equation for each set.



4. [A] Study exercise 3 and tell how many fours are in 20.
[B] Solve this equation. $20 \div 4 = \boxed{n}$

5. Solve the equations.

[A] $15 - 5 = \boxed{n}$
$10 - 5 = \boxed{n}$
$5 - 5 = \boxed{n}$
$15 \div 5 = \boxed{n}$

[B] $28 - 7 = \boxed{n}$
$21 - 7 = \boxed{n}$
$14 - 7 = \boxed{n}$
$7 - 7 = \boxed{n}$
$28 \div 7 = \boxed{n}$

[C] $30 - 10 = \boxed{n}$
$20 - 10 = \boxed{n}$
$10 - 10 = \boxed{n}$
$30 \div 10 = \boxed{n}$

We can use addition to help us find products. 4×5

Since $5 + 5 + 5 + 5 = 20$, we know that $4 \times 5 = 20$.

We can use subtraction to help us find quotients. $18 \div 6$

$$\begin{array}{r}18\\-6\\\hline 12\end{array} \nearrow \begin{array}{r}12\\-6\\\hline 6\end{array} \nearrow \begin{array}{r}6\\-6\\\hline 0\end{array}$$

Since we subtracted 6 three times, we know that $18 \div 6 = 3$.

EXERCISES

1. [A] Find these differences.

$$\begin{array}{r}24\\-4\\\hline\end{array}\quad\begin{array}{r}20\\-4\\\hline\end{array}\quad\begin{array}{r}16\\-4\\\hline\end{array}\quad\begin{array}{r}12\\-4\\\hline\end{array}\quad\begin{array}{r}8\\-4\\\hline\end{array}\quad\begin{array}{r}4\\-4\\\hline\end{array}$$

[B] How many times did you subtract 4?

[C] How many fours are in 24?

[D] Write a division equation about this.

2. [A] Find these differences.

$$\begin{array}{r}21\\-3\\\hline\end{array}\quad\begin{array}{r}18\\-3\\\hline\end{array}\quad\begin{array}{r}15\\-3\\\hline\end{array}\quad\begin{array}{r}12\\-3\\\hline\end{array}\quad\begin{array}{r}9\\-3\\\hline\end{array}\quad\begin{array}{r}6\\-3\\\hline\end{array}\quad\begin{array}{r}3\\-3\\\hline\end{array}$$

[B] How many times did you subtract 3?

[C] How many threes are in 21?

[D] Write a division equation about this.

3. [A] Find these differences.

$$\begin{array}{r}30\\-5\\\hline\end{array}\quad\begin{array}{r}25\\-5\\\hline\end{array}\quad\begin{array}{r}20\\-5\\\hline\end{array}\quad\begin{array}{r}15\\-5\\\hline\end{array}\quad\begin{array}{r}10\\-5\\\hline\end{array}\quad\begin{array}{r}5\\-5\\\hline\end{array}$$

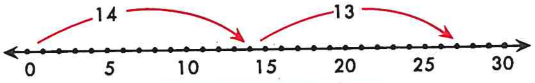
[B] How many times did you subtract 5?

[C] How many fives are in 30?

[D] Write a division equation about this.

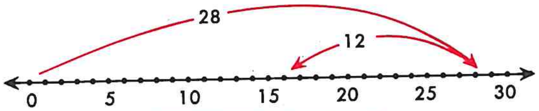
Division and the number line

Addition



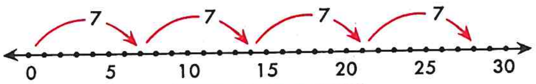
$14 + 13 = 27$

Subtraction



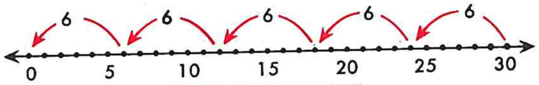
$28 - 12 = 16$

Multiplication



$4 \times 7 = 28$

Division

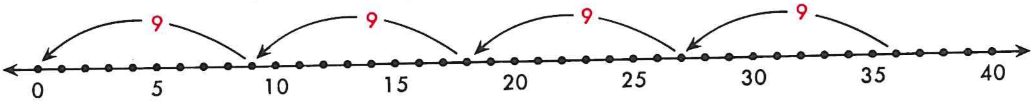


$30 \div 6 = 5$

EXERCISES

Answer the question. Then solve the equation.

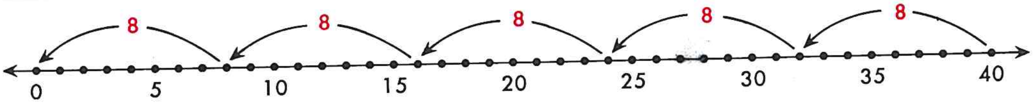
1.



[A] How many nines in 36?

[B] $36 \div 9 = \boxed{n}$

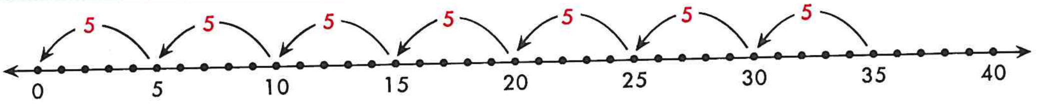
2.



[A] How many eights in 40?

[B] $40 \div 8 = \boxed{n}$

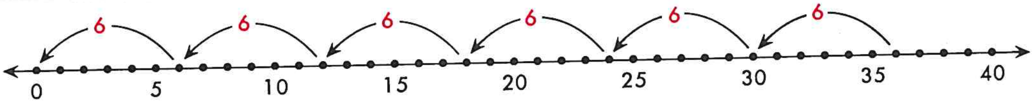
3.



[A] How many fives in 35?

[B] $35 \div 5 = \boxed{n}$

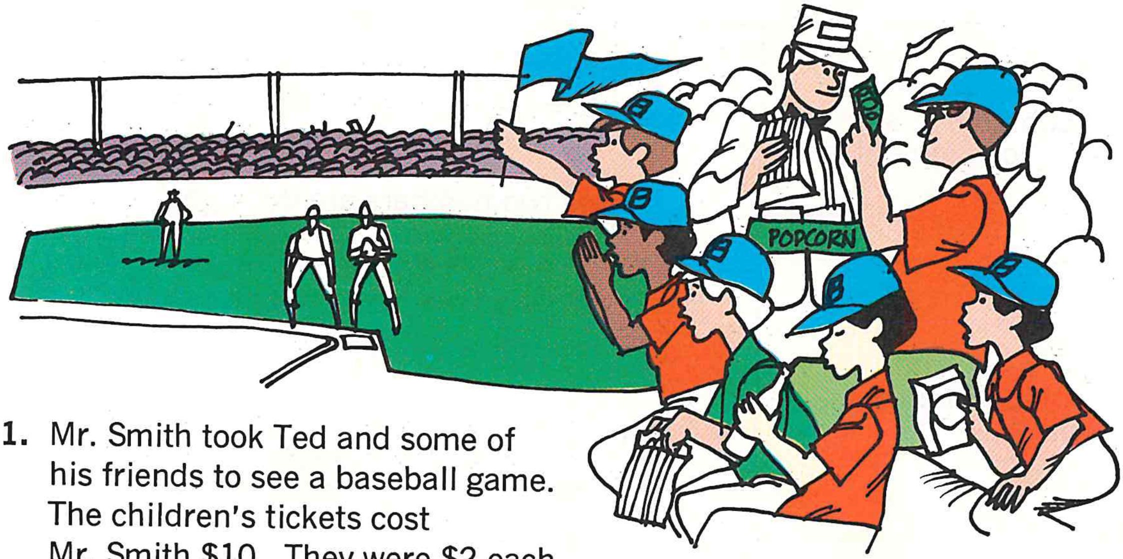
4.



[A] How many sixes in 36?

[B] $36 \div 6 = \boxed{n}$

At the ball game



1. Mr. Smith took Ted and some of his friends to see a baseball game. The children's tickets cost Mr. Smith $10. They were $2 each. How many children went to the ball game with Mr. Smith?

2. The Blue Sox scored 2 runs in each inning until the scoreboard read How many innings had they played then?

BLUE SOX	*8*
GREEN SOX	*0*

3. The final score was 9 to 6. Who won the game?

4. During the game, Mr. Smith spent 90 cents for popcorn. The popcorn cost 10 cents a bag. How many bags did he buy?

5. Each team had 6 pitchers. How many pitchers were there in all?

★ 6. Ted lived 15 miles from the ball park. Mr. Smith drove at the rate of 3 miles each 5 minutes. How long did it take to get from the ball park to Ted's house?

★ 7. Jim lived 6 miles farther from the ball park than Ted. How long would it take Mr. Smith to get from the ball park to Jim's house?

Quotients and missing factors

Subtraction and addition are related.

When we subtract, we find a missing addend.

$7 - 2 = \boxed{n}$ ⟵ ⟶ $\boxed{n} + 2 = 7$

These two numbers are the same.

Division and multiplication are related.

When we divide, we find a missing factor.

$12 \div 4 = \boxed{n}$ ⟵ ⟶ $\boxed{n} \times 4 = 12$

These two numbers are the same.

EXERCISES

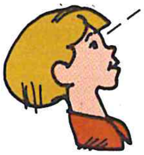
1. Find the missing factors.

[A] To find this quotient, I think $? \times 5 = 15$.

$15 \div 5$

[B] To find this quotient, I think $? \times 3 = 12$.

$12 \div 3$



2. Find the quotients.

[A] Think $? \times 2 = 6$

$6 \div 2 = \boxed{n}$

[B] Think $? \times 3 = 9$

$9 \div 3 = \boxed{n}$

[C] Think $? \times 4 = 8$

$8 \div 4 = \boxed{n}$

[D] Think $? \times 5 = 20$

$20 \div 5 = \boxed{n}$

[E] Think $? \times 6 = 6$

$6 \div 6 = \boxed{n}$

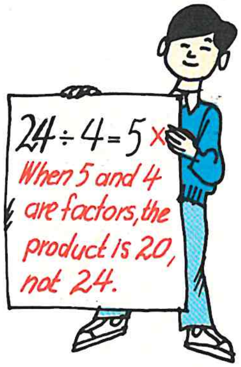
[F] Think $? \times 7 = 14$

$14 \div 7 = \boxed{n}$

Division and multiplication

DISCUSSION EXERCISES

The third-grade children checked their arithmetic papers. Peter checked Judy's paper. Under one exercise, he wrote →


24÷4=5 x
When 5 and 4 are factors, the product is 20, not 24.

1. Explain what Peter was trying to tell Judy.

2. What do you think Peter would say about this equation?

$$18 \div 3 = \boxed{7}$$

EXERCISES

1. Find the quotients.

[A] We know that $8 \div 4 = \boxed{n}$ because $2 \times 4 = 8$.
[B] We know that $9 \div 3 = \boxed{n}$ because $3 \times 3 = 9$.
[C] We know that $15 \div 5 = \boxed{n}$ because $3 \times 5 = 15$.
[D] We know that $15 \div 3 = \boxed{n}$ because $5 \times 3 = 15$.
[E] We know that $20 \div 5 = \boxed{n}$ because $4 \times 5 = 20$.
[F] We know that $20 \div 4 = \boxed{n}$ because $5 \times 4 = 20$.
[G] We know that $18 \div 3 = \boxed{n}$ because $6 \times 3 = 18$.
[H] We know that $18 \div 6 = \boxed{n}$ because $3 \times 6 = 18$.
[I] We know that $72 \div 8 = \boxed{n}$ because $9 \times 8 = 72$.

2. Find the quotients. Use multiplication to check your answers.

[A] $24 \div 8 = \boxed{n}$
[B] $30 \div 6 = \boxed{n}$
[C] $27 \div 9 = \boxed{n}$
[D] $12 \div 3 = \boxed{n}$
[E] $27 \div 3 = \boxed{n}$
[F] $21 \div 3 = \boxed{n}$
[G] $16 \div 8 = \boxed{n}$
[H] $20 \div 4 = \boxed{n}$
[I] $25 \div 5 = \boxed{n}$
[J] $35 \div 5 = \boxed{n}$
[K] $24 \div 6 = \boxed{n}$
[L] $18 \div 6 = \boxed{n}$

Think

Our names you're sure to find
If you use this little clue.
Our product is 18,
While our quotient's only 2.

WHO ARE WE?

Zero in division

DISCUSSION EXERCISES

In these exercises, tell whether each equation has many solutions, one solution, or no solution.

1. $\boxed{n} \times 0 = 5 \rightarrow 5 \div 0 = \boxed{n}$

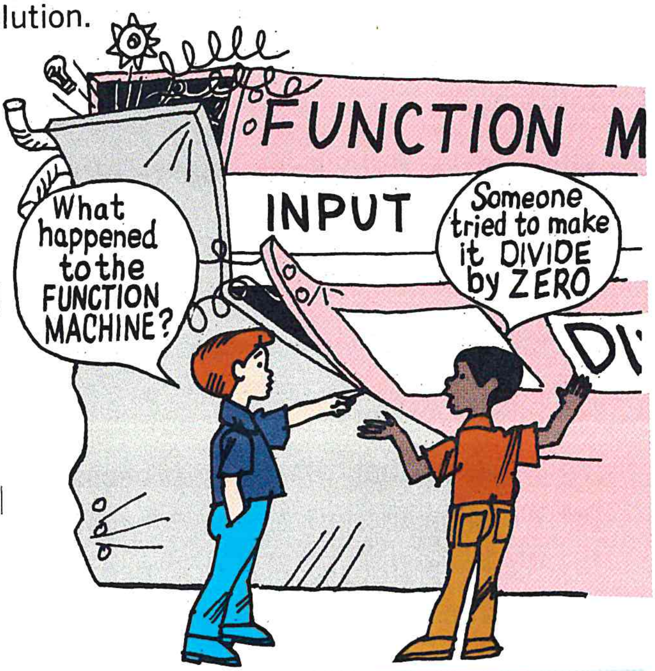
   Can you find a number for $\boxed{n}$?

2. $\boxed{n} \times 0 = 0 \rightarrow 0 \div 0 = \boxed{n}$

   Can you find more than one number for $\boxed{n}$?

3. $\boxed{n} \times 9 = 0 \rightarrow 0 \div 9 = \boxed{n}$

   What number times 9 equals zero?


FUNCTION M
INPUT
What happened to the FUNCTION MACHINE?
Someone tried to make it DIVIDE by ZERO
DI

① In exercise 1, you see that division by zero does not give **any number.**

② In exercise 2, you see that division by zero does not give **any one number.**

For these reasons:

We never divide by zero.

③ From exercise 3, you see that:

Zero divided by any number (other than zero) is zero.

One in division

DISCUSSION EXERCISES

1. Find the missing factors.

[A] $\boxed{n} \times 6 = 6$ [B] $\boxed{n} \times 18 = 18$ [C] $\boxed{n} \times 75 = 75$

Do you see that each factor is 1?

2. Find the quotients.

[A] Since $1 \times 6 = 6$, we know that $6 \div 6 = \boxed{n}$.

[B] Since $1 \times 18 = 18$, we know that $18 \div 18 = \boxed{n}$.

[C] Since $1 \times 75 = 75$, we know that $75 \div 75 = \boxed{n}$.

Any number (except zero) divided by itself is 1.

3. Find the missing factors.

[A] $\boxed{n} \times 1 = 9$ [B] $\boxed{n} \times 1 = 23$ [C] $\boxed{n} \times 1 = 86$

4. Now find these quotients.

[A] $9 \div 1 = \boxed{n}$ [B] $23 \div 1 = \boxed{n}$ [C] $86 \div 1 = \boxed{n}$

Any number divided by 1 is that number.

EXERCISES

1. Find the quotients.

[A] $7 \div 7 = \boxed{n}$
[B] $8 \div 1 = \boxed{n}$
[C] $0 \div 6 = \boxed{n}$
[D] $0 \div 18 = \boxed{n}$
[E] $27 \div 27 = \boxed{n}$
[F] $128 \div 1 = \boxed{n}$
[G] $0 \div 1 = \boxed{n}$
[H] $10 \div 10 = \boxed{n}$
[I] $0 \div 156 = \boxed{n}$
[J] $95 \div 95 = \boxed{n}$
[K] $95 \div 1 = \boxed{n}$
[L] $0 \div 16 = \boxed{n}$

2. Solve all the equations that you can. Some of them have no solutions.

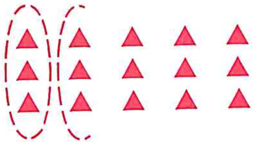
[A] $2 + 3 = \boxed{n}$
[B] $6 - \boxed{n} = 2$
[C] $8 \div 2 = \boxed{n}$
[D] $\boxed{n} \times 4 = 12$
[E] $8 \times \boxed{n} = 0$
[F] $\boxed{n} \div 7 = 1$
[G] $0 \div 6 = \boxed{n}$
[H] $19 \div \boxed{n} = 19$
[I] $\boxed{n} \times 0 = 6$
[J] $1 \div \boxed{n} = 1$
[K] $0 \times \boxed{n} = 6$
[L] $17 - 9 = \boxed{n}$
[M] $0 \times \boxed{n} = 9$
[N] $9 - 9 = \boxed{n}$
[O] $\boxed{n} \times 3 = 9$
[P] $\boxed{n} + 10 = 257$
[Q] $18 - \boxed{n} = 0$
[R] $58 \div \boxed{n} = 1$
[S] $\boxed{n} + 6 = 196$
[T] $\boxed{n} + 16 = 16$

Different ways to think about division

Sets

$15 \div 3 = \boxed{n}$

How many sets of 3 can we get from a set of 15? →



Subtraction

$15 \div 3 = \boxed{n}$

Starting with 15, how many times can we subtract 3? →

$$\begin{array}{r} 15 \\ -3 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array} \quad \begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array} \quad \begin{array}{r} 3 \\ -3 \\ \hline 0 \end{array}$$

Missing factor

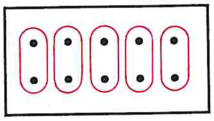
$15 \div 3 = \boxed{n}$

What number times 3 gives 15? → $\boxed{n} \times 3 = 15$

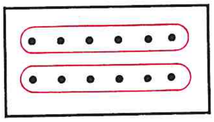
EXERCISES

1. Write a division equation for each exercise.

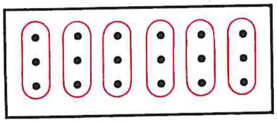
[A]



[B]



[C]



2. Write a division equation for each exercise.

[A]

$$\begin{array}{r} 18 \\ -3 \\ \hline 15 \end{array} \quad \begin{array}{r} 15 \\ -3 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array} \quad \begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array} \quad \begin{array}{r} 3 \\ -3 \\ \hline 0 \end{array}$$

[B]

$$\begin{array}{r} 28 \\ -7 \\ \hline 21 \end{array} \quad \begin{array}{r} 21 \\ -7 \\ \hline 14 \end{array} \quad \begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array} \quad \begin{array}{r} 7 \\ -7 \\ \hline 0 \end{array}$$

[C]

$$\begin{array}{r} 12 \\ -2 \\ \hline 10 \end{array} \quad \begin{array}{r} 10 \\ -2 \\ \hline 8 \end{array} \quad \begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -2 \\ \hline 4 \end{array} \quad \begin{array}{r} 4 \\ -2 \\ \hline 2 \end{array} \quad \begin{array}{r} 2 \\ -2 \\ \hline 0 \end{array}$$

[D]

$$\begin{array}{r} 40 \\ -8 \\ \hline 32 \end{array} \quad \begin{array}{r} 32 \\ -8 \\ \hline 24 \end{array} \quad \begin{array}{r} 24 \\ -8 \\ \hline 16 \end{array} \quad \begin{array}{r} 16 \\ -8 \\ \hline 8 \end{array} \quad \begin{array}{r} 8 \\ -8 \\ \hline 0 \end{array}$$

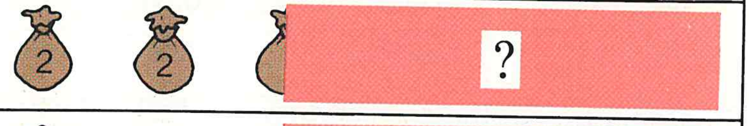
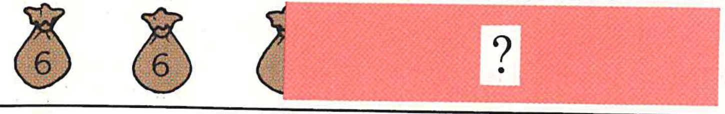
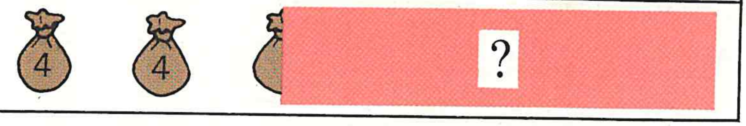
3. Write a division equation for each exercise.

[A] $\begin{array}{r} 27 \\ -9 \\ \hline 18 \end{array}$ $\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$ $\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$

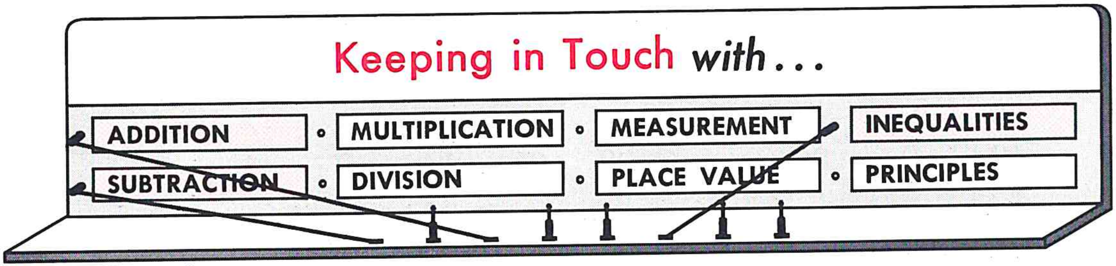
[B] $\begin{array}{r} 35 \\ -7 \\ \hline 28 \end{array}$ $\begin{array}{r} 28 \\ -7 \\ \hline 21 \end{array}$ $\begin{array}{r} 21 \\ -7 \\ \hline 14 \end{array}$ $\begin{array}{r} 14 \\ -7 \\ \hline 7 \end{array}$ $\begin{array}{r} 7 \\ -7 \\ \hline 0 \end{array}$

4. Solve the equations.		**5.** Now find the quotients.
[A] $\boxed{n} \times 6 = 12$	→	**[A]** $12 \div 6 = \boxed{n}$
[B] $\boxed{n} \times 3 = 9$	→	**[B]** $9 \div 3 = \boxed{n}$
[C] $\boxed{n} \times 4 = 8$	→	**[C]** $8 \div 4 = \boxed{n}$
[D] $\boxed{n} \times 2 = 10$	→	**[D]** $10 \div 2 = \boxed{n}$
[E] $\boxed{n} \times 3 = 12$	→	**[E]** $12 \div 3 = \boxed{n}$
[F] $\boxed{n} \times 5 = 25$	→	**[F]** $25 \div 5 = \boxed{n}$
[G] $\boxed{n} \times 6 = 18$	→	**[G]** $18 \div 6 = \boxed{n}$
[H] $\boxed{n} \times 5 = 15$	→	**[H]** $15 \div 5 = \boxed{n}$
[I] $\boxed{n} \times 2 = 14$	→	**[I]** $14 \div 2 = \boxed{n}$
[J] $\boxed{n} \times 3 = 21$	→	**[J]** $21 \div 3 = \boxed{n}$

6. In each exercise, tell how many bags of marbles.

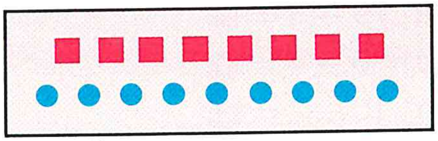
[A]	15 marbles	
[B]	20 marbles	
[C]	14 marbles	
[D]	18 marbles	
[E]	35 marbles	
[F]	28 marbles	

Keeping in Touch *with . . .*

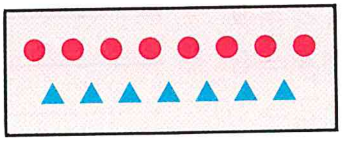


1. Write 2 addition and 2 subtraction equations for each exercise.

[A]



[B]



2. Give the sums as quickly as you can.

[A] 5 + 4
[B] 6 + 2
[C] 9 + 1
[D] 4 + 6
[E] 5 + 5
[F] 8 + 3
[G] 7 + 7
[H] 6 + 7
[I] 8 + 9
[J] 3 + 7
[K] 8 + 2
[L] 3 + 5
[M] 5 + 6
[N] 7 + 5
[O] 8 + 8
[P] 4 + 9
[Q] 7 + 6
[R] 9 + 9
[S] 6 + 8
[T] 7 + 8

3. Give the differences as quickly as you can.

[A] 8 − 3
[B] 9 − 2
[C] 6 − 5
[D] 11 − 4
[E] 13 − 8
[F] 15 − 7
[G] 17 − 9
[H] 16 − 8
[I] 15 − 9
[J] 13 − 5
[K] 14 − 5
[L] 10 − 6
[M] 14 − 6
[N] 9 − 4
[O] 16 − 7
[P] 18 − 9
[Q] 12 − 7
[R] 15 − 8
[S] 10 − 3
[T] 13 − 7

4. List these numbers in order, from smallest to largest.

68,423 100,000 16,842 50,000 68,433
49,375 674,897 49,365 684,230 68,300

5. Do not try to find the correct answer. Just tell whether each answer is more than 70 or less than 70.

[A] 37 + 38
[B] 27 + 38
[C] 27 + 48
[D] 17 + 58
[E] 83 − 8
[F] 83 − 18
[G] 93 − 18
[H] 93 − 28
[I] 46 + 27
[J] 95 − 26
[K] 93 − 19
[L] 15 + 54
[M] 50 + 21
[N] 80 − 11
[O] 90 − 19

6. Find the sums.

[A] $\begin{array}{r} 35 \\ +24 \\ \hline \end{array}$ [B] $\begin{array}{r} 35 \\ +25 \\ \hline \end{array}$ [C] $\begin{array}{r} 48 \\ +26 \\ \hline \end{array}$ [D] $\begin{array}{r} 57 \\ +19 \\ \hline \end{array}$ [E] $\begin{array}{r} 68 \\ +24 \\ \hline \end{array}$ [F] $\begin{array}{r} 73 \\ +14 \\ \hline \end{array}$

7. Find the sums.

[A] $\begin{array}{r}66\\+27\\\hline\end{array}$ [B] $\begin{array}{r}99\\+4\\\hline\end{array}$ [C] $\begin{array}{r}88\\+7\\\hline\end{array}$ [D] $\begin{array}{r}76\\+66\\\hline\end{array}$ [E] $\begin{array}{r}35\\+48\\\hline\end{array}$ [F] $\begin{array}{r}87\\+32\\\hline\end{array}$

[G] $\begin{array}{r}93\\+27\\\hline\end{array}$ [H] $\begin{array}{r}69\\+25\\\hline\end{array}$ [I] $\begin{array}{r}46\\+58\\\hline\end{array}$ [J] $\begin{array}{r}57\\+48\\\hline\end{array}$ [K] $\begin{array}{r}76\\+64\\\hline\end{array}$ [L] $\begin{array}{r}19\\+27\\\hline\end{array}$

8. Find the differences.

[A] $\begin{array}{r}83\\-22\\\hline\end{array}$ [B] $\begin{array}{r}92\\-33\\\hline\end{array}$

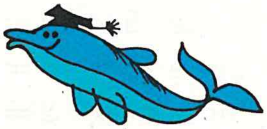
[C] $\begin{array}{r}57\\-34\\\hline\end{array}$ [D] $\begin{array}{r}61\\-59\\\hline\end{array}$

[E] $\begin{array}{r}122\\-34\\\hline\end{array}$ [F] $\begin{array}{r}74\\-68\\\hline\end{array}$

[G] $\begin{array}{r}182\\-93\\\hline\end{array}$ [H] $\begin{array}{r}65\\-37\\\hline\end{array}$

Think

Dave is three times as old as Sue. In three years, he will be twice as old as Sue. How old are Dave and Sue now?



9. Find the sums and differences.

[A] $\begin{array}{r}35\\+28\\\hline\end{array}$ [B] $\begin{array}{r}72\\-43\\\hline\end{array}$ [C] $\begin{array}{r}68\\+78\\\hline\end{array}$ [D] $\begin{array}{r}39\\-19\\\hline\end{array}$ [E] $\begin{array}{r}92\\-15\\\hline\end{array}$

[F] $\begin{array}{r}67\\+67\\\hline\end{array}$ [G] $\begin{array}{r}95\\+78\\\hline\end{array}$ [H] $\begin{array}{r}60\\-17\\\hline\end{array}$ [I] $\begin{array}{r}34\\-19\\\hline\end{array}$ [J] $\begin{array}{r}78\\+62\\\hline\end{array}$

[K] $\begin{array}{r}104\\-58\\\hline\end{array}$ [L] $\begin{array}{r}69\\+76\\\hline\end{array}$ [M] $\begin{array}{r}143\\-58\\\hline\end{array}$ [N] $\begin{array}{r}107\\-89\\\hline\end{array}$ [O] $\begin{array}{r}36\\+99\\\hline\end{array}$

★ **10.** Find the sums and differences.

[A] $\begin{array}{r}345\\+167\\\hline\end{array}$ [B] $\begin{array}{r}6291\\+1963\\\hline\end{array}$ [C] $\begin{array}{r}642\\-285\\\hline\end{array}$ [D] $\begin{array}{r}1354\\-678\\\hline\end{array}$ [E] $\begin{array}{r}1876\\+695\\\hline\end{array}$ [F] $\begin{array}{r}3604\\-538\\\hline\end{array}$

[G] $\begin{array}{r}6026\\-4444\\\hline\end{array}$ [H] $\begin{array}{r}6395\\+7867\\\hline\end{array}$ [I] $\begin{array}{r}836\\125\\612\\+983\\\hline\end{array}$ [J] $\begin{array}{r}37\\48\\69\\+58\\\hline\end{array}$ [K] $\begin{array}{r}767\\859\\986\\+798\\\hline\end{array}$ [L] $\begin{array}{r}9284\\6579\\8936\\+7867\\\hline\end{array}$

Quotients and factors

EXERCISES

1. Find the quotients.

[A] Since $7 \times 8 = 56$, we know that $56 \div 8 = \boxed{n}$.
[B] Since $9 \times 7 = 63$, we know that $63 \div 7 = \boxed{n}$.
[C] Since $8 \times 6 = 48$, we know that $48 \div 6 = \boxed{n}$.
[D] Since $6 \times 7 = 42$, we know that $42 \div 7 = \boxed{n}$.
[E] Since $7 \times 5 = 35$, we know that $35 \div 5 = \boxed{n}$.
[F] Since $9 \times 8 = 72$, we know that $72 \div 8 = \boxed{n}$.
[G] Since $9 \times 6 = 54$, we know that $54 \div 6 = \boxed{n}$.
[H] Since $8 \times 8 = 64$, we know that $64 \div 8 = \boxed{n}$.
[I] Since $6 \times 10 = 60$, we know that $60 \div 10 = \boxed{n}$.
[J] Since $12 \times 3 = 36$, we know that $36 \div 3 = \boxed{n}$.
[K] Since $14 \times 3 = 42$, we know that $42 \div 3 = \boxed{n}$.
[L] Since $4 \times 15 = 60$, we know that $60 \div 15 = \boxed{n}$.
[M] Since $5 \times 19 = 95$, we know that $95 \div 19 = \boxed{n}$.
[N] Since $8 \times 12 = 96$, we know that $96 \div 12 = \boxed{n}$.

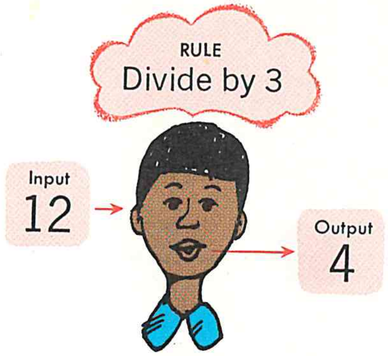
2. Find the quotients.

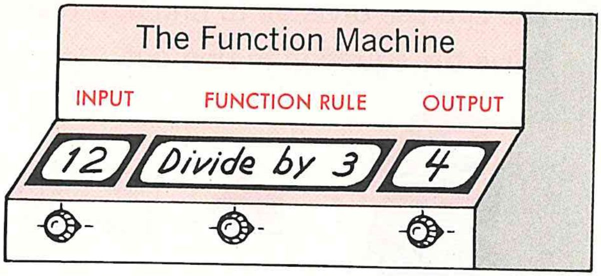
[A] $18 \div 3$
[B] $20 \div 5$
[C] $12 \div 4$
[D] $24 \div 3$
[E] $27 \div 9$
[F] $24 \div 4$
[G] $16 \div 2$
[H] $7 \div 1$
[I] $30 \div 5$
[J] $21 \div 7$
[K] $35 \div 7$
[L] $4 \div 4$
[M] $18 \div 9$
[N] $15 \div 3$
[O] $18 \div 2$
[P] $28 \div 7$

3. Find the missing numbers.

[A] We know that $28 \div 7 = \boxed{n}$ because $4 \times 7 = 28$.
[B] We know that $42 \div 6 = \boxed{n}$ because $7 \times 6 = 42$.
[C] We know that $54 \div 9 = 6$ because $\boxed{n} \times 9 = 54$.
[D] We know that $40 \div 5 = 8$ because $\boxed{n} \times 5 = 40$.
[E] We know that $63 \div 7 = \boxed{n}$ because $9 \times 7 = 63$.
[F] We know that $48 \div 6 = \boxed{n}$ because $8 \times 6 = 48$.
[G] We know that $72 \div 9 = 8$ because $\boxed{n} \times 9 = 72$.
[H] We know that $36 \div 4 = \boxed{n}$ because $9 \times 4 = 36$.

The function machine





EXERCISES

Think about the function machine and give the missing numbers.

1. Function Rule

Divide by 2

	Input	Output
	8	4
	6	3
[A]	10	▥
[B]	4	▥
[C]	12	▥

2. Function Rule

Divide by 3

	Input	Output
	6	2
[A]	15	▥
	12	4
[B]	9	▥
[C]	3	▥

3. Function Rule

Divide by 4

	Input	Output
	12	3
[A]	8	▥
[B]	16	▥
[C]	4	▥
	20	5

4. Function Rule

[A] Divide by ▥

	Input	Output
	5	1
[B]	10	▥
	15	3
	20	4
[C]	25	▥

5. Function Rule

Divide by 10

	Input	Output
	20	2
[A]	60	▥
	50	5
[B]	80	▥
[C]	▥	4

6. Function Rule

Divide by 2

	Input	Output
	12	6
[A]	▥	5
[B]	▥	7
[C]	▥	4
	16	8

Division and sets again

DISCUSSION EXERCISES

1. You can use division to find **how many sets.**
Solve the equation to find out.

12 books

How many stacks of 4 can you make?

$12 \div 4 = n$

2. You can use division to find **how many in each set.**
Solve the equation to find out.

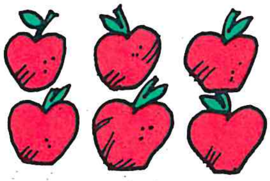
15 cookies

If the cookies are divided equally among 3 children, how many does each child get?

$15 \div 3 = n$

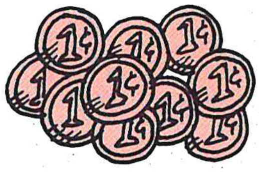
3. Write a division equation for each exercise.

[A] 6 apples



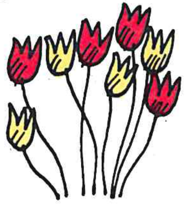
How many does each child get if you divide the apples equally among 3 children?

[B] 10 cents



How many children can have 2 cents each?

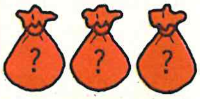
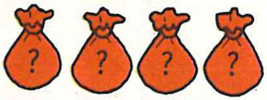
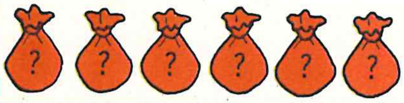
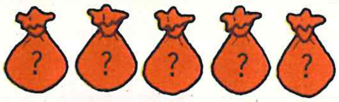
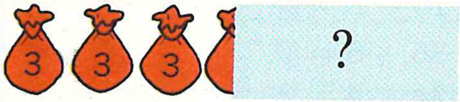
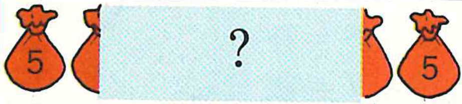
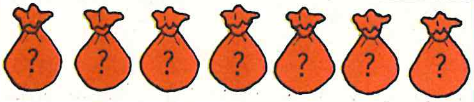
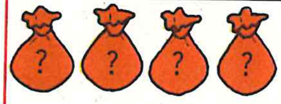
[C] 8 flowers



How many are in each vase if they are divided equally in 2 vases?

EXERCISES

In each exercise, the marbles are equally divided in the bags.

1.	12 marbles		How many in each bag?
2.	18 marbles		How many bags?
3.	16 marbles		How many in each bag?
4.	24 marbles		How many bags?
5.	30 marbles		How many in each bag?
6.	28 marbles		How many bags?
7.	27 marbles		How many bags?
8.	40 marbles		How many in each bag?
9.	21 marbles		How many bags?
10.	35 marbles		How many bags?
11.	42 marbles		How many in each bag?
12.	40 marbles		How many in each bag?

Finding quotients

Quotients are easiest to find when you know related multiplication facts. The missing factors in exercise 2 can be found if you know the products in exercise 1. The quotients in exercise 3 can be found if you know the missing factors in exercise 2.

EXERCISES

1. Find the products.

[A] $2 \times 7 = n$
[B] $9 \times 2 = n$
[C] $5 \times 4 = n$
[D] $6 \times 3 = n$
[E] $8 \times 4 = n$
[F] $4 \times 4 = n$
[G] $7 \times 5 = n$
[H] $2 \times 6 = n$
[I] $5 \times 5 = n$
[J] $9 \times 3 = n$
[K] $6 \times 6 = n$
[L] $3 \times 5 = n$
[M] $1 \times 9 = n$
[N] $4 \times 6 = n$
[O] $3 \times 8 = n$
[P] $5 \times 3 = n$
[Q] $4 \times 7 = n$
[R] $6 \times 0 = n$
[S] $5 \times 8 = n$
[T] $6 \times 5 = n$

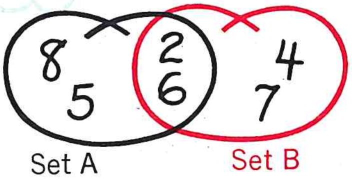
2. Find the missing factors.

[A] $n \times 8 = 40$
[B] $n \times 3 = 27$
[C] $4 \times n = 24$
[D] $6 \times n = 0$
[E] $n \times 2 = 18$
[F] $n \times 8 = 24$
[G] $4 \times n = 16$
[H] $2 \times n = 14$
[I] $n \times 7 = 28$
[J] $6 \times n = 36$
[K] $8 \times n = 32$
[L] $n \times 9 = 9$
[M] $n \times 5 = 25$
[N] $5 \times n = 20$
[O] $n \times 5 = 35$
[P] $2 \times n = 12$
[Q] $n \times 3 = 15$
[R] $n \times 5 = 30$
[S] $6 \times n = 18$
[T] $n \times 5 = 15$

3. Find the quotients.

[A] $14 \div 2 = n$
[B] $35 \div 5 = n$
[C] $18 \div 6 = n$
[D] $12 \div 2 = n$
[E] $27 \div 3 = n$
[F] $16 \div 4 = n$
[G] $32 \div 8 = n$
[H] $15 \div 5 = n$
[I] $24 \div 4 = n$
[J] $9 \div 9 = n$
[K] $18 \div 2 = n$
[L] $36 \div 6 = n$
[M] $40 \div 8 = n$
[N] $30 \div 5 = n$
[O] $28 \div 7 = n$
[P] $0 \div 6 = n$
[Q] $25 \div 5 = n$
[R] $24 \div 8 = n$
[S] $15 \div 3 = n$
[T] $20 \div 5 = n$

Think



Find the sum of
1. the numbers in set A.
2. the numbers in B but not A.
3. the numbers in both A and B.
4. the numbers in A or B but not both.

Short stories

1. Answer the question. Then write a division equation about the story.

[A] 20 marbles.
Same number to each of 5 boys.
How many marbles for each boy?

[B] 15 cookies.
3 cookies to each child.
How many children get cookies?

[C] 30 cents.
Apples 6 cents each.
How many apples can we buy?

[D] 24 cents spent for 3 oranges.
How much per orange?

[E] 18 people. 6 in each car.
How many cars are needed?

[F] 24 seats. Same number in each of 6 rows.
How many seats in each row?

[G] 14 children.
Same number of girls as boys.
How many of each?

[H] 20 players for 4 teams. How many players for each team?

[I] 18 players. 3 on each team.
How many teams?

[J] 28 days.
7 days per week.
How many weeks?

[K] 16 minutes.
2 minutes per mile.
How many miles?

[L] 24 feet. 3 feet per yard.
How many yards?

[M] 36 feet.
4 per dog.
How many dogs?

2. Answer the question. Then write a division equation about the sets. Remember when you think about division, the sets should have the same number.

[A] 12 dots.
4 in each set.
How many sets?

[B] 12 dots.
2 sets.
How many in each set?

[C] 15 dots.
3 in each set.
How many sets?

[D] 10 dots.
5 sets.
How many in each set?

[E] 15 dots.
3 sets.
How many in each set?

[F] 18 dots.
3 in each set.
How many sets?

[G] 16 dots.
4 sets.
How many in each set?

[H] 24 dots.
6 in each set.
How many sets?

[I] 24 dots. 8 sets.
How many in each set?

Using division

EXERCISES

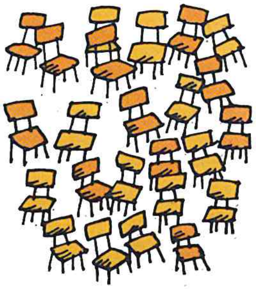
1. Answer the questions about the set of chairs.

[A] How many rows of 3 can you make?

[B] How many rows of 8 can you make?

[C] How many in each row if you divide them equally in 4 rows?

[D] How many in each row if you divide them equally in 6 rows?



24 chairs

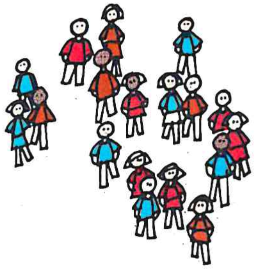
2. Answer the questions about the set of children.

[A] How many groups of 9 can be found?

[B] How many at each table if they are divided equally among 6 tables?

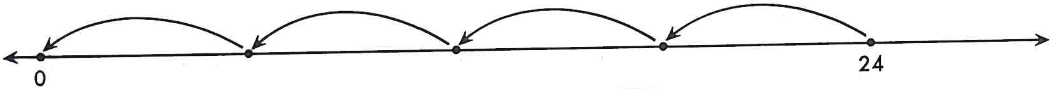
[C] How many girls are there if there are as many boys as girls?

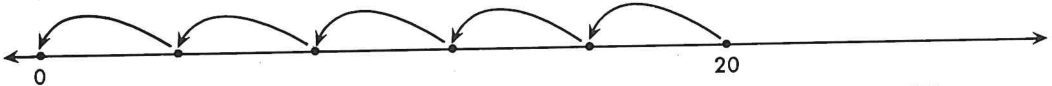
[D] How many teams of 3 can be formed for a spelling contest?

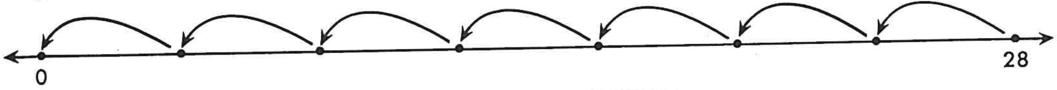


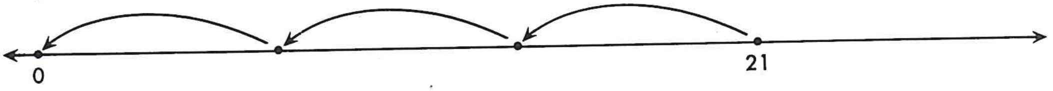
18 children

3. In a given problem, all jumps are the same length. How long is each jump?

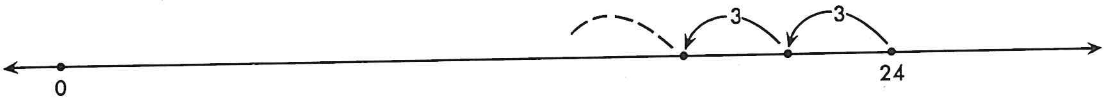
[A]


[B]


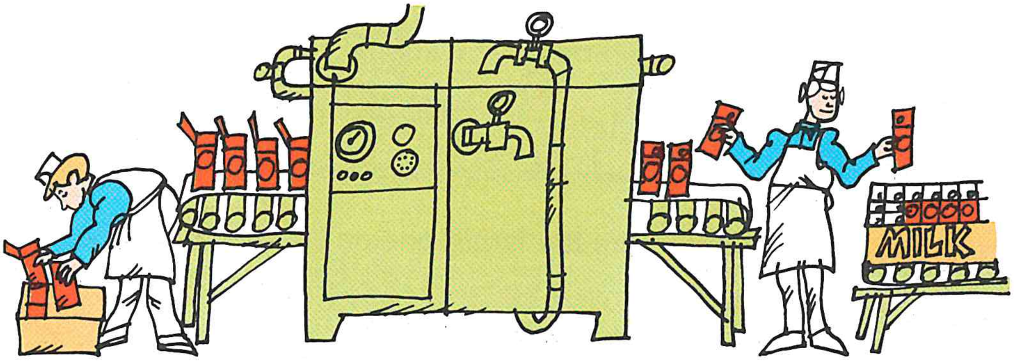
[C]


[D]


4. How many jumps of 3 will it take to get to 0?



At the dairy



1. Cartons of milk are put in boxes, with 6 cartons in each row. If a box holds 24 cartons of milk, how many rows are there?

2. A machine fills 28 half-gallon milk cartons every 4 minutes. How many cartons does it fill in one minute?

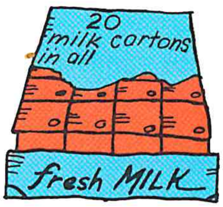
3. Cartons of ice cream are placed in large wire racks before they are put in the freezer. Each rack holds 48 cartons in 6 rows. How many cartons are in each row?

4. When Susan's class went to the dairy, they went into the pasteurizing room in groups of 6. There are 30 children in Susan's class. How many groups of 6 did they have?

5. On the way back to school, 5 children rode in each car. How many cars did they need?

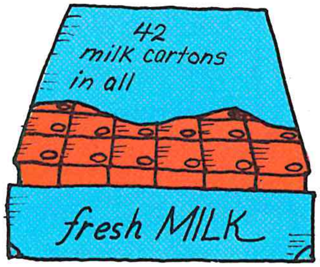
6. Miss Smith, the teacher, asked the children to write a story about their trip to the dairy. Don decided to make up some problems for his story. See if you can work them.

[A]

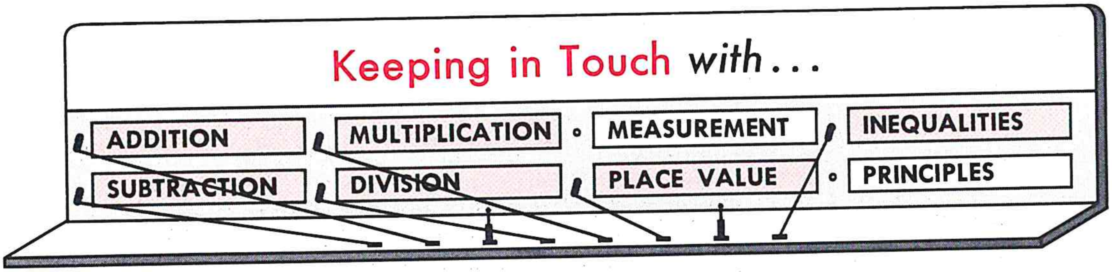


How many cartons are in each row?

[B]



How many cartons are in each row?



1. For each pair of numbers, write the larger one on your paper.

[A] 84 64	[B] 807 811	[C] 8263 7379	[D] 4003 4010	[E] 8327 8309
[F] 43,005 43,004	[G] 40,040 40,050	[H] 60,003 60,012	[I] 648,356 647,356	[J] 260,009 260,101

2. Find the sums and differences.

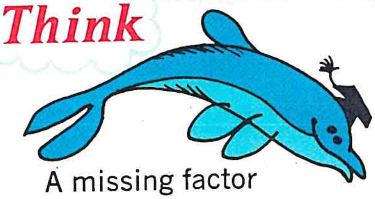
[A] $\begin{array}{r} 38 \\ +46 \\ \hline \end{array}$ [B] $\begin{array}{r} 72 \\ -39 \\ \hline \end{array}$ [C] $\begin{array}{r} 65 \\ +43 \\ \hline \end{array}$ [D] $\begin{array}{r} 39 \\ -19 \\ \hline \end{array}$ [E] $\begin{array}{r} 56 \\ +9 \\ \hline \end{array}$ [F] $\begin{array}{r} 120 \\ -7 \\ \hline \end{array}$ [G] $\begin{array}{r} 148 \\ +32 \\ \hline \end{array}$

[H] $\begin{array}{r} 74 \\ -56 \\ \hline \end{array}$ [I] $\begin{array}{r} 93 \\ +87 \\ \hline \end{array}$ [J] $\begin{array}{r} 65 \\ -28 \\ \hline \end{array}$ [K] $\begin{array}{r} 127 \\ -68 \\ \hline \end{array}$ [L] $\begin{array}{r} 88 \\ +88 \\ \hline \end{array}$ [M] $\begin{array}{r} 702 \\ -24 \\ \hline \end{array}$ [N] $\begin{array}{r} 803 \\ -56 \\ \hline \end{array}$

3. Answer **T** (true) or **F** (false).

[A] $7 + 6$ is one more than $6 + 6$.
[B] 7×6 is six more than 6×6.
[C] $26 + 27 > 50$
[D] Ten hundreds are one thousand.
[E] One hundred thousand is one million.
[F] $80 \div 8 = 10$
[G] $90{,}000 \times 9 = 10{,}000$
[H] One thousand is one hundred tens.
[I] $56 - 28 < 30$
[J] 9×5 is nine more than 8×5.
★ [K] 12×14 is one less than 13×13.
★ [L] 15×15 is one more than 14×16.
★ [M] $37 + 35 > 70$ and $48 + 54 < 100$
★ [N] $3486 + 3486 = 3485 + 3487$
★ [O] $7 + 5 < 12$ or $7 + 5 = 12$ or $7 + 5 > 12$
★ [P] $8 \times 8 = 9 \times 7$

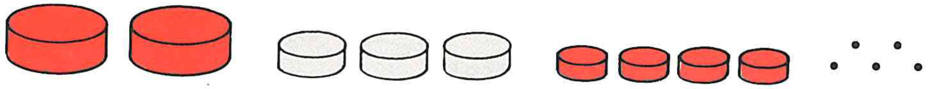
Think

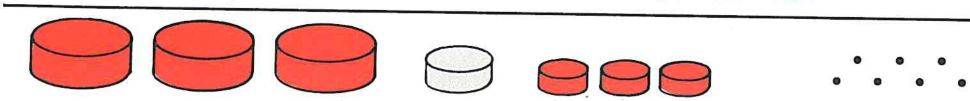


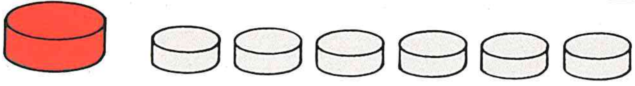
A missing factor
I cannot be
Whenever the product
Is larger than me.

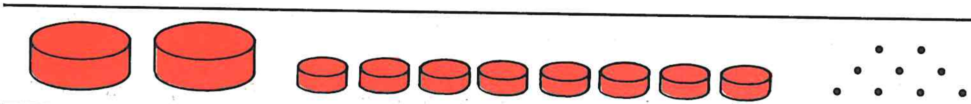
WHO AM I?

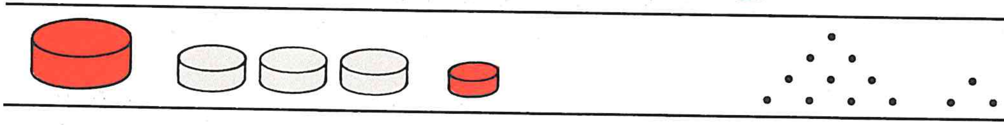
4. Tell how many beads in each exercise. Pretend that the large red cans hold 1000 beads each, the gray cans hold 100 beads each, the small red cans hold 10 beads each, and each dot is 1 bead.

[A]


[B]


[C]


[D]


[E]


5. Find the products.

[A] 2 × 6
[B] 3 × 4
[C] 4 × 9
[D] 6 × 4
[E] 7 × 2
[F] 9 × 3
[G] 6 × 6
[H] 5 × 3
[I] 6 × 5
[J] 2 × 8
[K] 5 × 5
[L] 3 × 2
[M] 8 × 4
[N] 3 × 8
[O] 7 × 3
[P] 4 × 5
[Q] 5 × 9
[R] 9 × 2
[S] 5 × 7
[T] 5 × 2
[U] 4 × 7
[V] 3 × 6
[W] 8 × 5
[X] 4 × 4

6. No numbers are given in these exercises. You are to tell whether you would add, subtract, multiply, or divide to find each answer.

[A] John has |||||| marbles and Bill has |||||| marbles. How many marbles do they have together?

[B] In exercise **A**, how many more marbles does John have than Bill?

[C] Mike arranged |||||| chairs in |||||| rows. How many chairs in each row?

[D] Jim has |||||| pages of stamps with |||||| stamps on each page. How many stamps does he have on these pages?

[E] There were |||||| books on the shelf before Jane took |||||| of them. How many books were left?

[F] There were |||||| pieces of candy to be passed among |||||| children. All the children get the same number of pieces. How many pieces does each child get?

Chapter review

EXERCISES

1. Find the quotients.

[A] Since $4 \times 9 = 36$, we know that $\rightarrow 36 \div 9 = \boxed{n}$. $\rightarrow 36 \div 4 = \boxed{n}$.

[B] Since $6 \times 8 = 48$, we know that $\rightarrow 48 \div 8 = \boxed{n}$. $\rightarrow 48 \div 6 = \boxed{n}$.

[C] Since $9 \times 7 = 63$, we know that $\rightarrow 63 \div 9 = \boxed{n}$. $\rightarrow 63 \div 7 = \boxed{n}$.

[D] Since $5 \times 8 = 40$, we know that $\rightarrow 40 \div 5 = \boxed{n}$. $\rightarrow 40 \div 8 = \boxed{n}$.

2. Find the missing factors.

[A] $\boxed{n} \times 3 = 12$	[C] $\boxed{n} \times 6 = 24$	[E] $\boxed{n} \times 3 = 15$	[G] $\boxed{n} \times 3 = 27$
[B] $7 \times \boxed{n} = 14$	[D] $3 \times \boxed{n} = 24$	[F] $8 \times \boxed{n} = 32$	[H] $6 \times \boxed{n} = 36$

3. Find the quotients.

[A] $27 \div 3 = \boxed{n}$	[C] $14 \div 7 = \boxed{n}$	[E] $12 \div 3 = \boxed{n}$	[G] $32 \div 8 = \boxed{n}$
[B] $24 \div 3 = \boxed{n}$	[D] $24 \div 6 = \boxed{n}$	[F] $36 \div 6 = \boxed{n}$	[H] $15 \div 3 = \boxed{n}$

4.

$$\begin{array}{r} 24 \\ -3 \\ \hline 21 \end{array} \quad \begin{array}{r} 21 \\ -3 \\ \hline 18 \end{array} \quad \begin{array}{r} 18 \\ -3 \\ \hline 15 \end{array} \quad \begin{array}{r} 15 \\ -3 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ -3 \\ \hline 9 \end{array} \quad \begin{array}{r} 9 \\ -3 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ -3 \\ \hline 3 \end{array} \quad \begin{array}{r} 3 \\ -3 \\ \hline 0 \end{array}$$

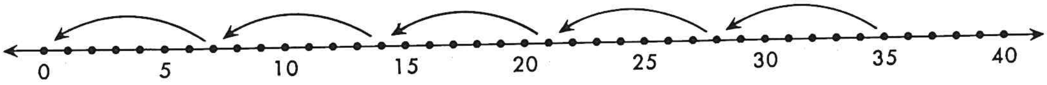
[A] How many times was 3 subtracted?

[B] How many threes are in 24?

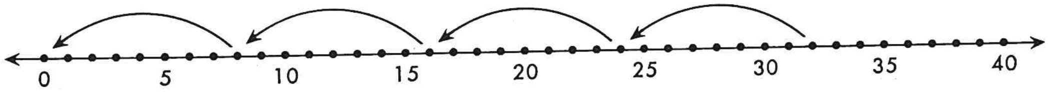
[C] Write a division equation about this.

5. Write a division equation for each number-line picture.

[A]



[B]



SHORT STORIES

1. 18 dots.
   3 in each column.
   How many columns?

2. 15 children.
   5 in each car.
   How many cars?

3. 48 books.
   8 shelves (same number on each).
   How many books on each shelf?

4. Rode bicycle 32 miles.
   Traveled 4 miles each hour.
   How many hours?

5. 14 pieces of candy.
   Same number in each hand.
   How many pieces in each hand?

6. 50 marbles.
   5 sacks (same number in each).
   How many marbles in each sack?

7. 27 sails.
   3 sails on each boat.
   How many boats?

8. 36 players.
   9 on each team.
   How many teams?

9. Have 35 cents.
   Apples 7 cents each.
   How many apples can we buy?

10. 36 pieces of pie.
    6 pieces in each pie.
    How many pies?

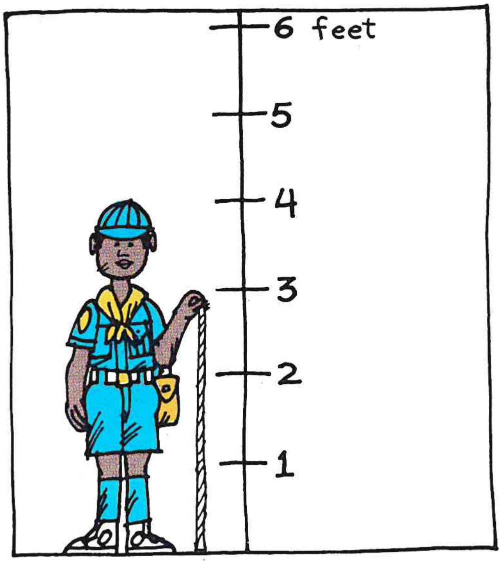
11. 6 rows of chairs.
    42 chairs.
    How many chairs in each row?

12. 28 jet plane engines.
    4 engines on each plane.
    How many jet planes?

CHAPTER 6 Measurement

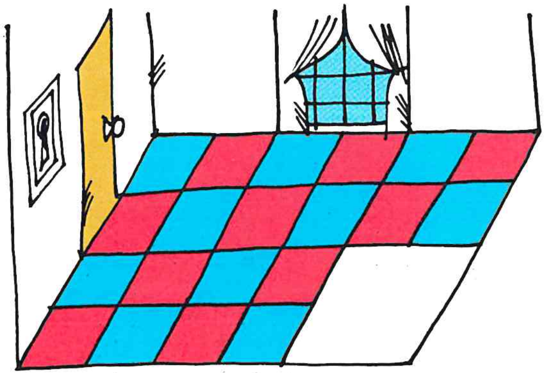
Counting and measurement

DISCUSSION EXERCISES



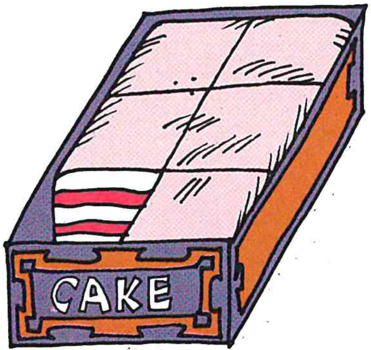
1. How tall is the Cub Scout?

2. How long is his rope?



3. How many colored tiles are on the floor now?

4. How many more tiles are needed to cover the floor?

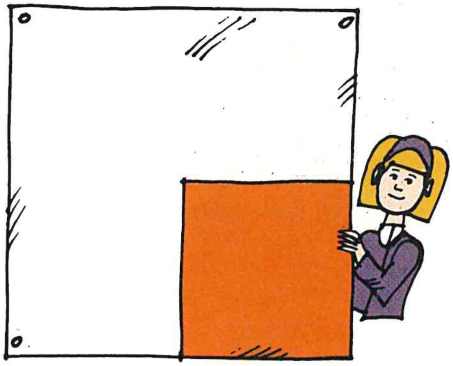


5. How many pieces of party cake are left in the box?

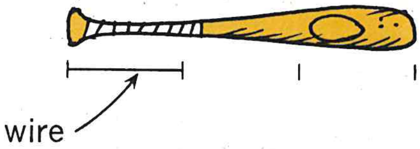
6. How many pieces of cake will the box hold?

EXERCISES

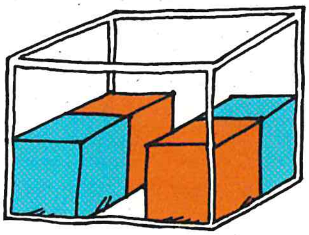
1. Sally used a cardboard square to tell how large her mirror is. How many of these squares will it take to cover the mirror?



2. Tom used a wire to tell about his lucky baseball bat. The bat is as long as how many of the wires?

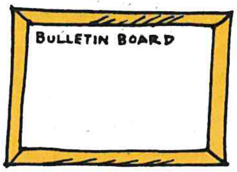


3. Jane used blocks to tell about her aquarium. How many blocks will the aquarium hold?



4. Which object (the wire, the square, or the block) would you use to tell:

[A] how large the bulletin board is?



[B] how much the drawer will hold?

[C] how tall the lamp is?

Units for measuring

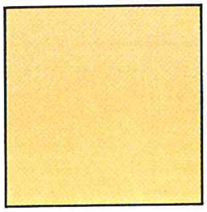
DISCUSSION EXERCISES

1. You can use a wire or a rope to find length. What are some other objects that you could use to talk about length?

wire

rope

2. You can use a cardboard square or a stamp to find area. What are some other objects you could use to find area?



cardboard square

stamp

3. You can use a block or a sugar cube to find volume. What are some other objects you might use to find volume?

block

sugar cube

The objects we count when we measure are called units.

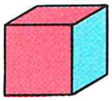
Ⓐ A **unit** for finding length

segment

Ⓑ A **unit** for finding area

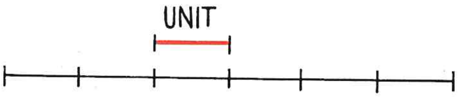
square

Ⓒ A **unit** for finding volume

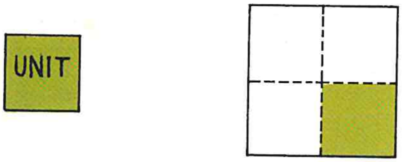


cube

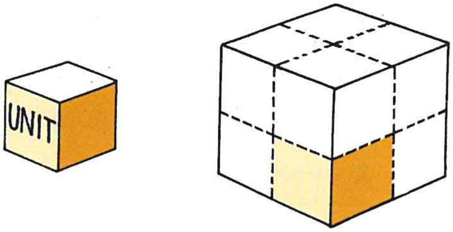
4. [A] We count segment units to find length. Explain why the length of the black mark is 6.



[B] We count square units to find area. Explain why the area of the big square is 4.

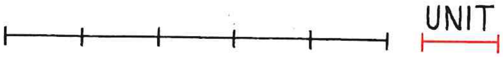


[C] We count cube units to find volume. Explain why the volume of the large block is 8.

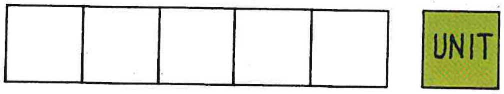


EXERCISES

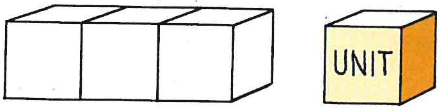
1. The length of the black mark is _?_.



2. The area of this figure is _?_.

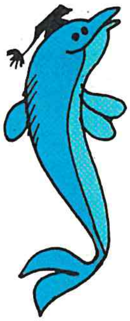


3. The volume of this figure is _?_.



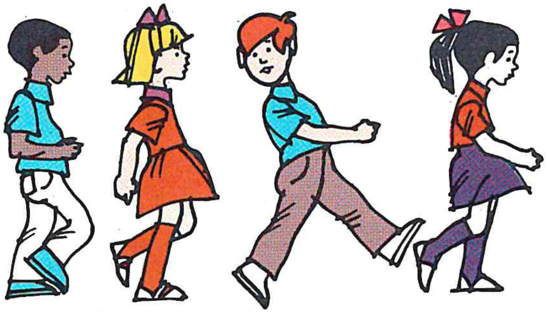
Think

Study the pattern. Then copy the equations, giving the missing numbers.



1 × 9 = 10 − 1
2 × 9 = 20 − 2
3 × 9 = 30 − 3
4 × 9 = 40 − 4
5 × 9 = ▥ − ▥
8 × 9 = ▥ − ▥
13 × 9 = ▥ − ▥

Finding length



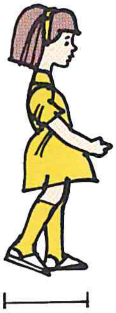
Jim measured the distance across the room by counting the number of steps he took to walk from one side to the other. His step was the "segment." He took 12 steps.

When Sue walked across the room, she took 16 steps.

Ann and Joe each made it in 14 steps.

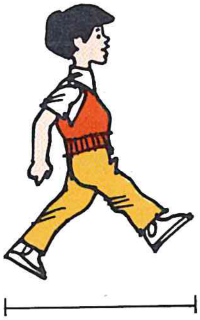
EXERCISES

1. Who took the most steps?
2. Who took the fewest steps?
3. Who took the longest steps?
4. Who took the shortest steps?
5. Which two children took about the same size steps?



Cathy's segment

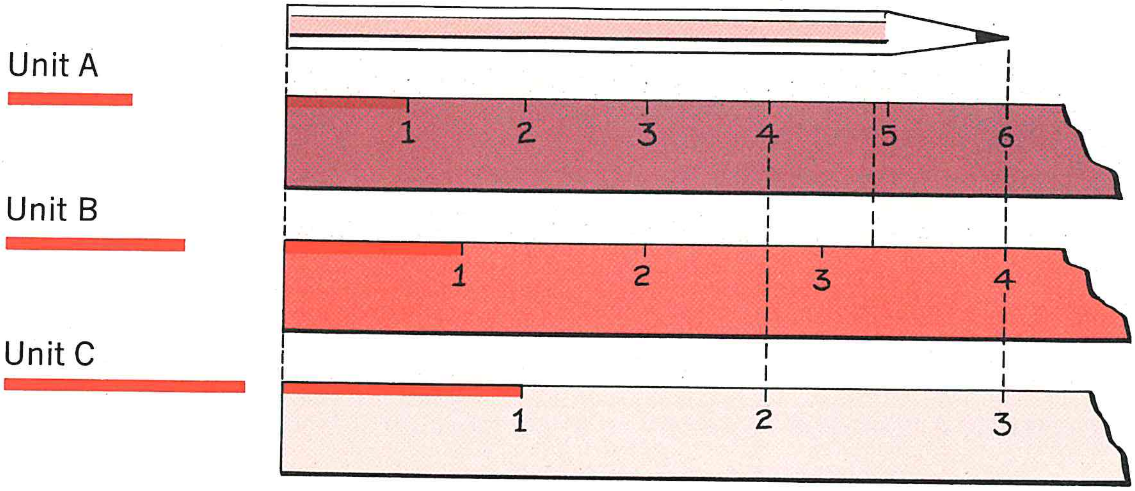
6. Which two children can best compare the size of two different rooms by steps?
7. Cathy took shorter steps than anyone in the class. Will she take more steps or fewer steps than Sue to cross the room?
8. Tom took longer steps than any of the other children. Guess the number of steps Tom needs to get across the room.



Tom's segment

Measuring with different unit segments

Here are some units you can use to measure a pencil.



EXERCISES

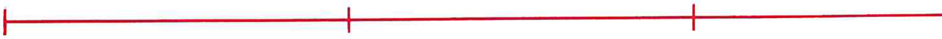
1. Using unit A, how many units long is the pencil?
2. Using unit B, how many units long is the pencil?
3. Using unit C, how many units long is the pencil?
4. Which is the smallest unit?
5. Which unit gives the largest number for the length of the pencil?
6. Which is the largest unit?
7. Which unit gives the smallest number for the length of the pencil?
8. Joe measured his pen using unit A. He found it was 4 units long. What is the length of his pen using unit C?
9. Jane measured her comb using unit B. She found it was a little more than 3 units long. If she had used unit A, what would she have found?

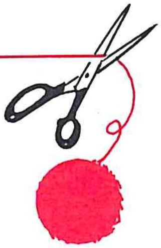
★ 10. Bill and Jane each made a ruler. Jane used a unit as wide as her hand. Bill used a unit as wide as his finger. If they both measure the same thing, who will get the larger number?

Choosing units

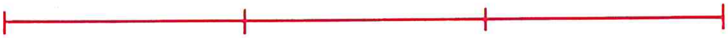
The third-grade children were making string puppets. Bobby, Susan, and Carol were cutting string. They thought it would be fun to choose their own units for measuring. They each cut a piece of string 3 units long.

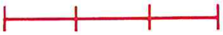
Bobby cut his string this long:





Carol's string was this long:



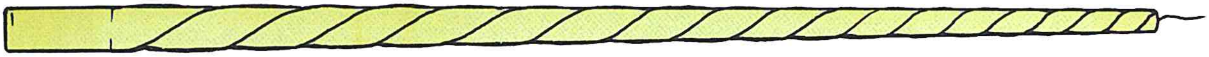
Susan's string looked like this: 

DISCUSSION EXERCISES

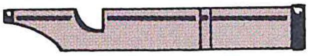
1. Did the children use the same-sized unit?
2. How would their strings compare if they had used the same-sized unit?
3. Who used the longest unit?
4. Who used the shortest unit?

EXERCISES

1. Which of these segments is Bobby's unit?
   [A] [B]
   [C]
2. Which segment is Carol's unit? [A] [B]
   [C]
3. Which segment is Susan's unit? [A]
   [B] [C]
4. Whose unit will give the largest number when you measure this candle?



5. Whose unit will give the smallest number when you measure the candle?
6. Using Susan's unit, pick the best guess for the length of the whistle.
   [A] 1 [B] 24 [C] 4 [D] 10

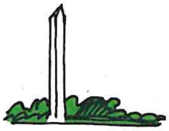


DISCUSSION EXERCISES

1. The unit we choose for measuring should be useful. Explain why we would **not** choose this unit to measure a tack.

2. Explain why we would **not** use an inch unit to answer these questions.

[A]



How tall is the Washington Monument?

[B]

How high does the X-15 airplane fly?

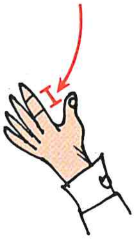
[C]

How long is the Mississippi River?

3. Explain why it is useful to choose certain units and give them names.

Four units often used are given below. The pictures will help you see **about** how long these units are.

Inch



Foot

12 inches

Yard

3 foot units

Mile

A train with 120 boxcars is about 1 mile long.

1760 yards

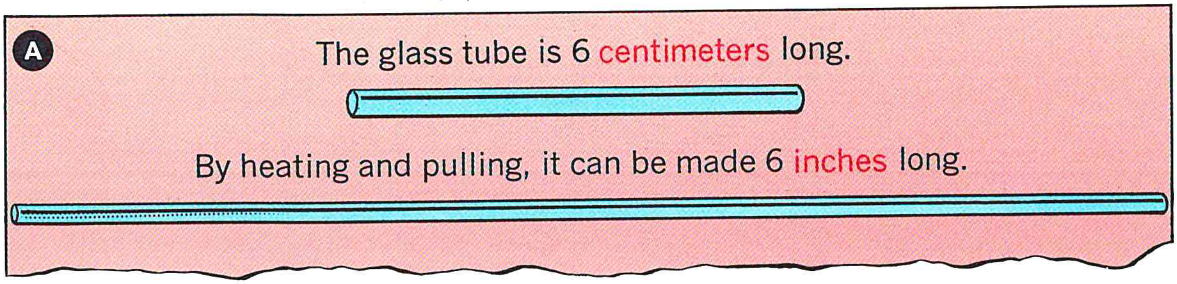
EXERCISES

Which unit (inch, foot, yard, or mile) would you choose to measure

1. your finger?
2. a pencil?
3. the distance from New York to California?
4. a spoon?
5. the width of your room?
6. the distance to the moon?

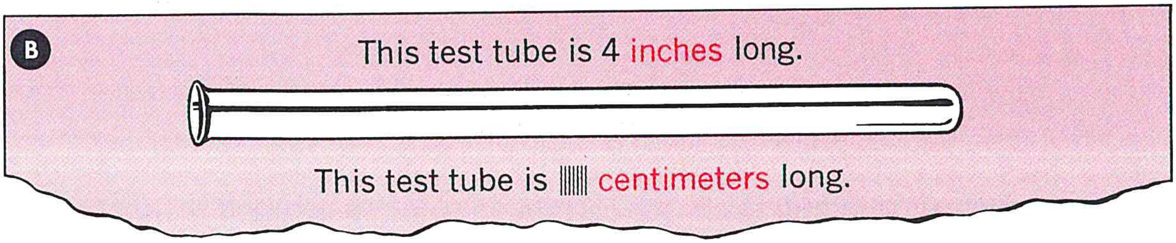
Using special units to find length

When we give a measurement, it helps to **name** the unit. Two important units are named on the two science papers below.



The glass tube is 6 centimeters long.

By heating and pulling, it can be made 6 inches long.



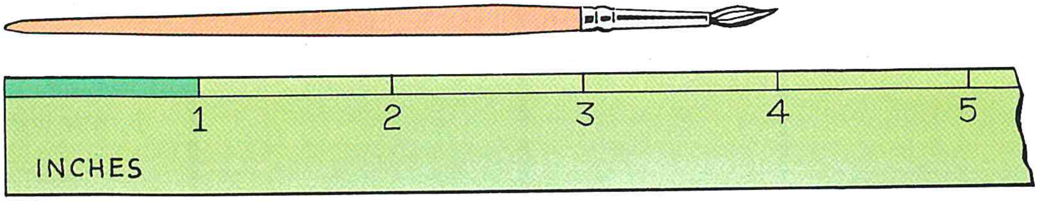
This test tube is 4 inches long.

This test tube is ▥ centimeters long.

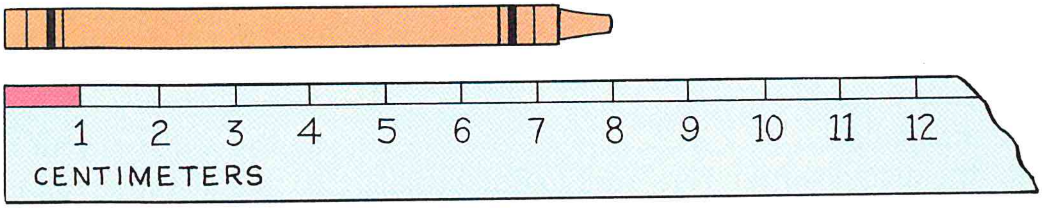
EXERCISES

1. Is the centimeter unit longer or shorter than an inch?
2. Is the missing number on paper B more or less than 4?
3. Give the measurement for each object.

[A]

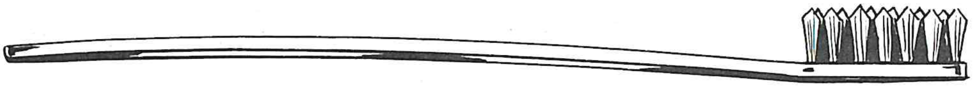


[B]

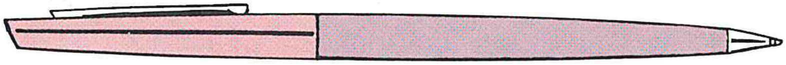


4. Use your ruler to measure each object in inches.

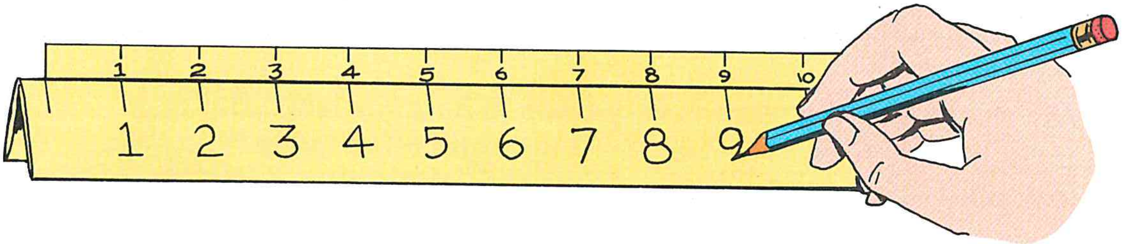
[A]



[B]

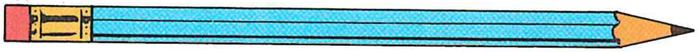


5. You can make a centimeter ruler. Fold a sheet of paper 2 or 3 times. Copy the marks from the ruler below on a folded edge of the paper.

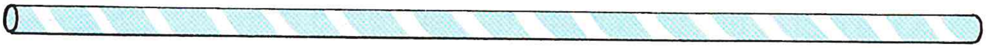


6. Use your centimeter ruler to measure each object.

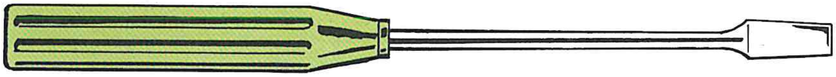
[A]



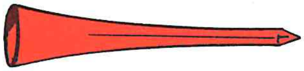
[B]



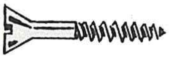
[C]



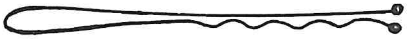
[D]



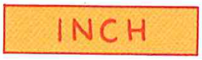
[E]



[F]

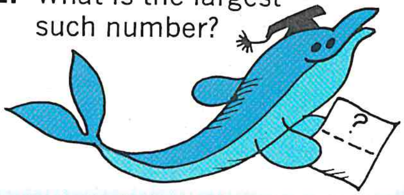


★ [G]



Think

1. What is the smallest 4-digit number that uses just 3 different digits?
2. What is the largest such number?

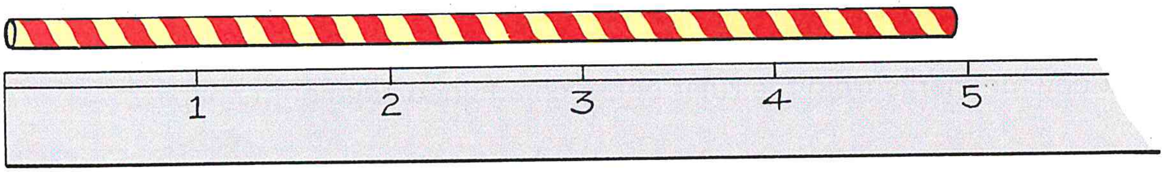


Measurement is not exact

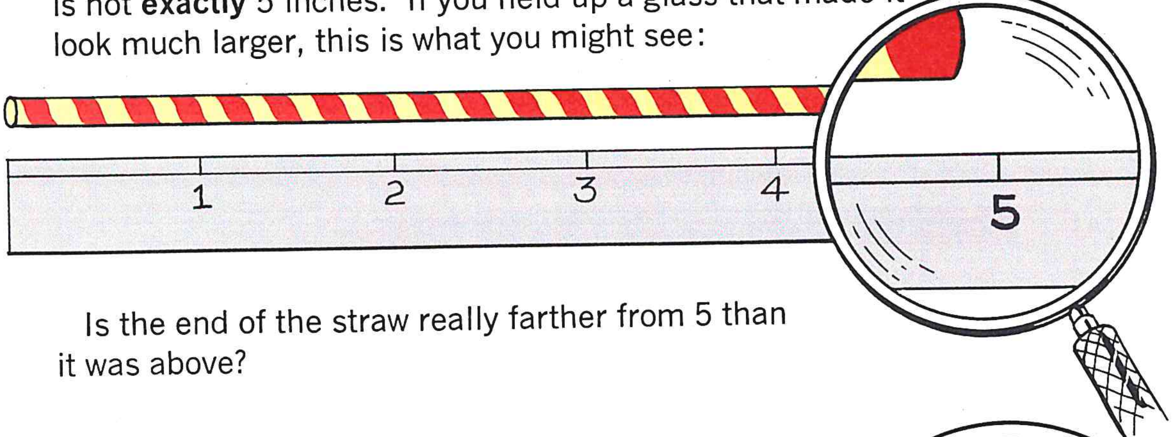
DISCUSSION EXERCISES

1. [A] What is the length of this straw?

[B] Is the length of the straw closer to 4 inches or 5 inches?

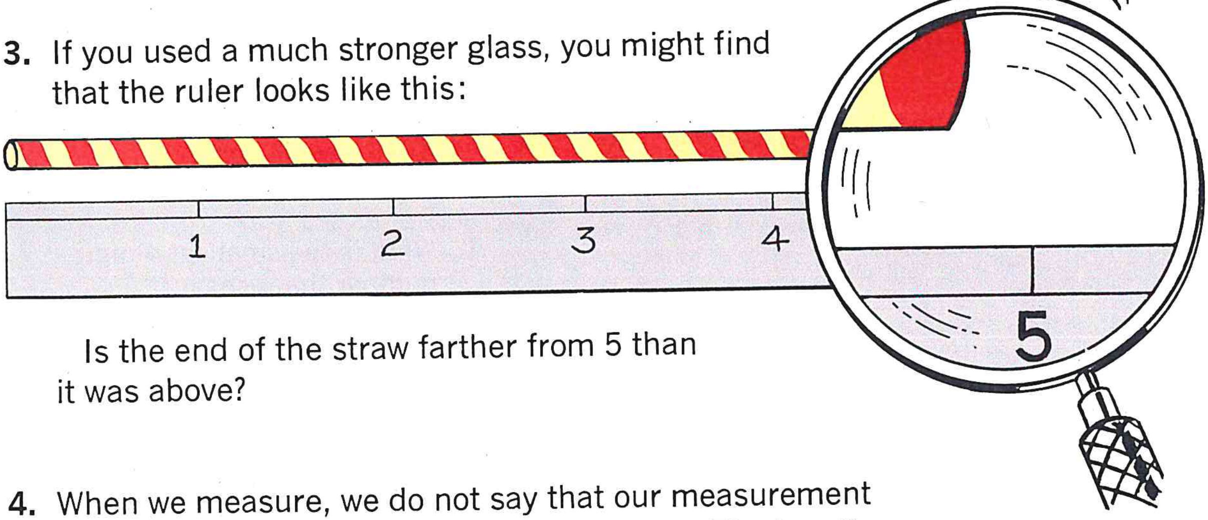


2. As you can see, the straw is **very close** to 5 inches long. But it is not **exactly** 5 inches. If you held up a glass that made it look much larger, this is what you might see:



Is the end of the straw really farther from 5 than it was above?

3. If you used a much stronger glass, you might find that the ruler looks like this:



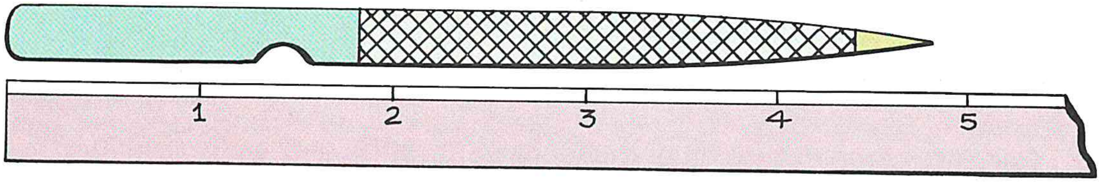
Is the end of the straw farther from 5 than it was above?

4. When we measure, we do not say that our measurement is exactly right. We only say that it is close. The length of the straw is close to ||||| inches.

Measuring to the nearest inch

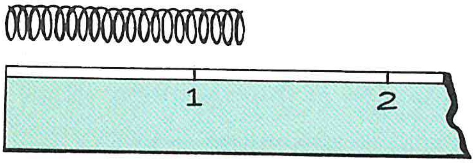
DISCUSSION EXERCISES

1. The length of the nail file is **more than** 4 inches, but **less than** 5 inches. Is it closer to 4 or to 5?



2. The length of the nail file (to the nearest inch) is ▥ inches.

3. The length of the spring is between 1 and 2 inches. Is it closer to 1 or to 2?

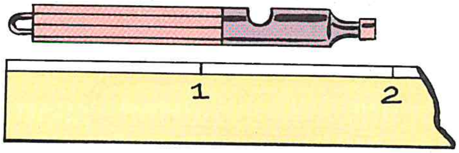


4. The length of the spring (to the nearest inch) is ▥ inches.

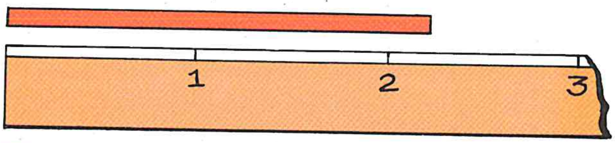
EXERCISES

1. Give the length of each object to the nearest inch.

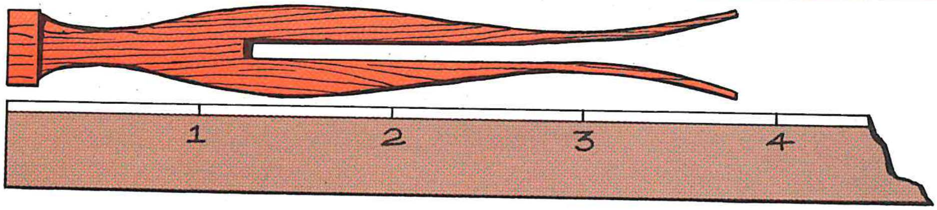
[A]



[B]



[C]

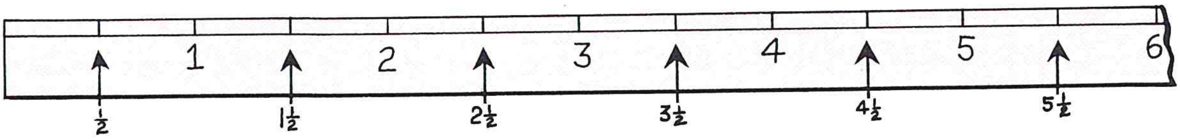


2. Measure each segment to the nearest inch.

[A] [B]
[C]
[D]
[E] [F] [G]

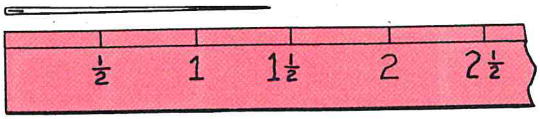
Measuring to the nearest half inch

Here is a ruler with half-inch marks.

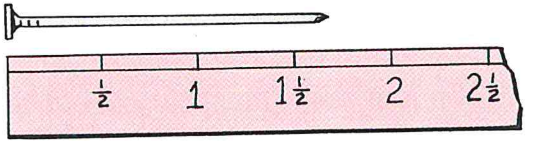


We read "two and one half" for $2\frac{1}{2}$.

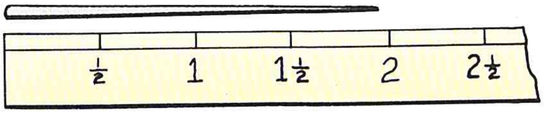
Here are some examples of measurement to the nearest half inch.



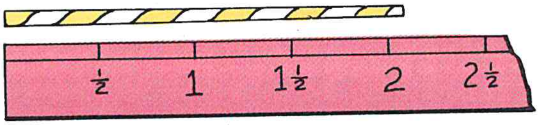
The length of the needle is about $1\frac{1}{2}$.



The length of the nail is about $1\frac{1}{2}$.



The length of the toothpick is about 2.

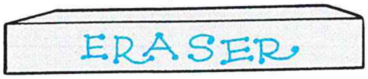


The length of the candle is about 2.

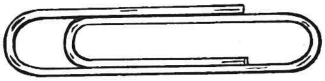
EXERCISES

1. Use your inch ruler to measure each object to the nearest half inch.

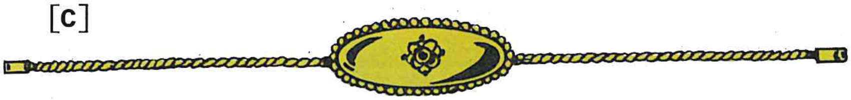
[A]



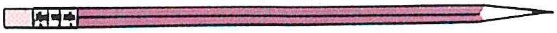
[B]



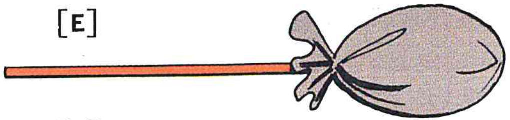
[C]



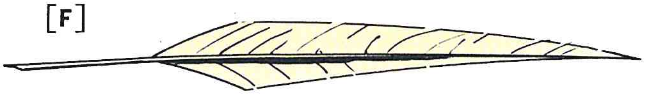
[D]



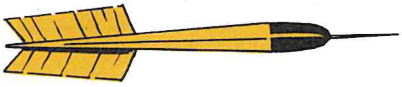
[E]



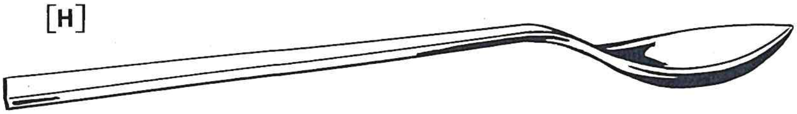
[F]



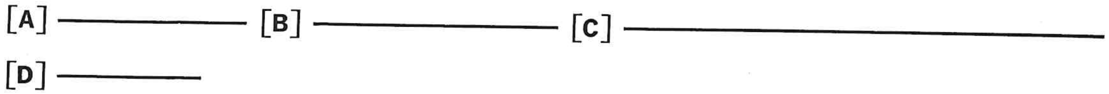
[G]



[H]



2. Make half-centimer marks on your centimeter ruler. Measure these segments to the nearest half centimeter:



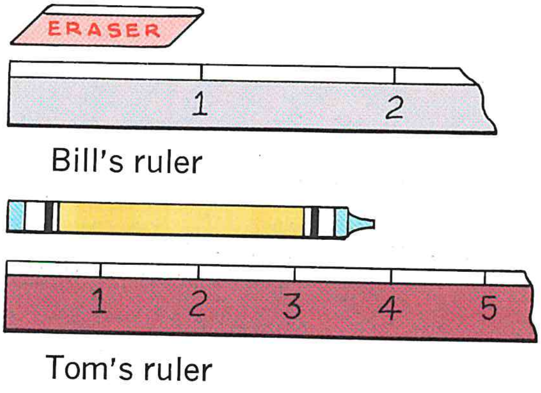
3. Use your centimeter ruler and an inch ruler to find about how many centimeters there are in 2 inches.

4. About how many inches are there in 10 centimeters?

★ 5. About how many centimeters are there in 1 inch? (Give your answer to the nearest half centimeter.) How many half inches are in 1 inch? Which is longer, a half inch or a centimeter?

★ 6. There are 12 inches in 1 foot. How many half inches are in 1 foot? There are 3 feet in 1 yard. How many inches are in 1 yard? How many inches are in a half-yard? How many half inches are in a half yard?

★ 7. Bill and Tom were comparing lengths, using rulers with different units. Bill used an inch ruler. Tom used a ruler that he made using half-inch units. Since Tom's units were a half inch, he decided to call them **hinches.**



[A] Bill measured his eraser. It was 1 inch long. How many "hinches" long was the eraser?

[B] Bill measured a pencil and found that it was 6 inches long. How many "hinches" long was the pencil?

[C] Tom found that his crayon was 4 "hinches" long (to the nearest "hinch"). How long was the crayon to the nearest inch?

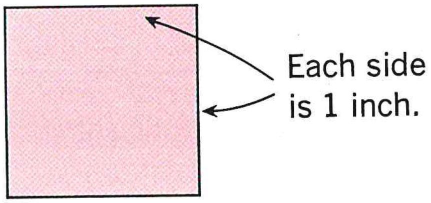
[D] Bill measured Jane's comb and found it was $4\frac{1}{2}$ inches long. What would Tom find if he measured the comb, using the "hinch" ruler?

[E] Tom's ruler is 17 "hinches" long. How many inches long is it?

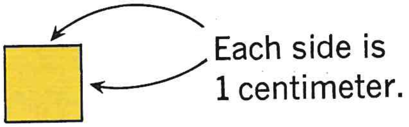
Finding area

You can find area by counting squares. Some unit squares that are used to find area are the square inch and the square centimeter.

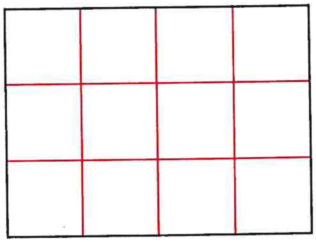
Square inch



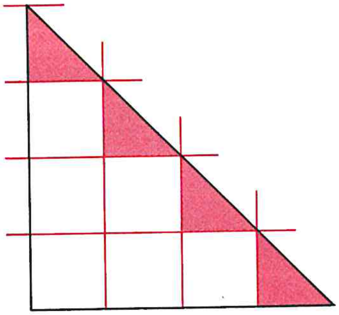
Square centimeter



DISCUSSION EXERCISES



The area of this rectangular region is ▥ units.

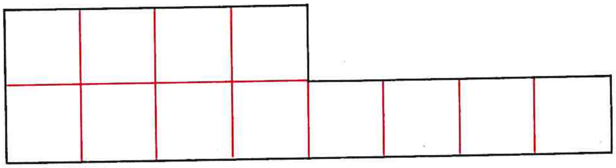


The area of this triangular region is ▥ units.

1. Explain how to find the area of the rectangle.

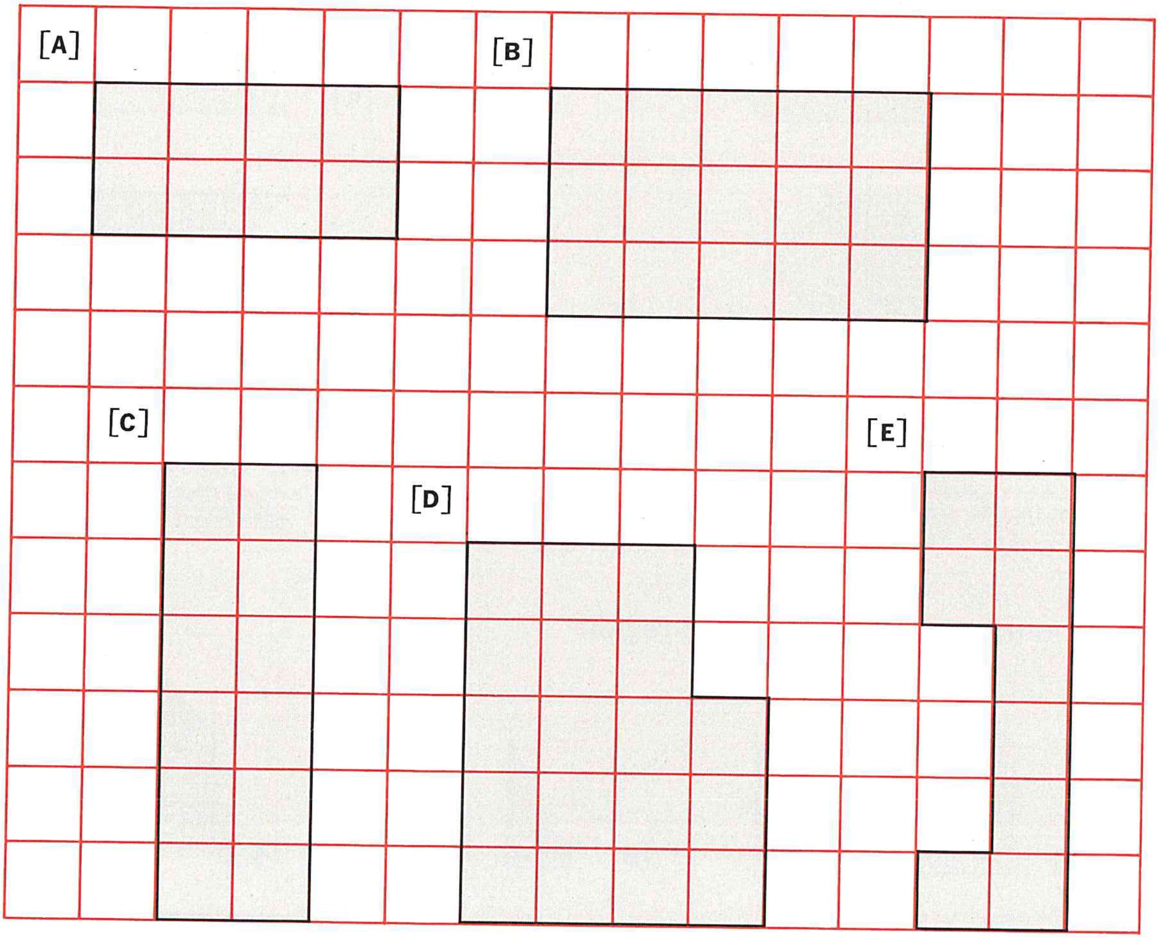
2. Explain how to find the area of the triangle.

3. What is the area of the L-shaped region?

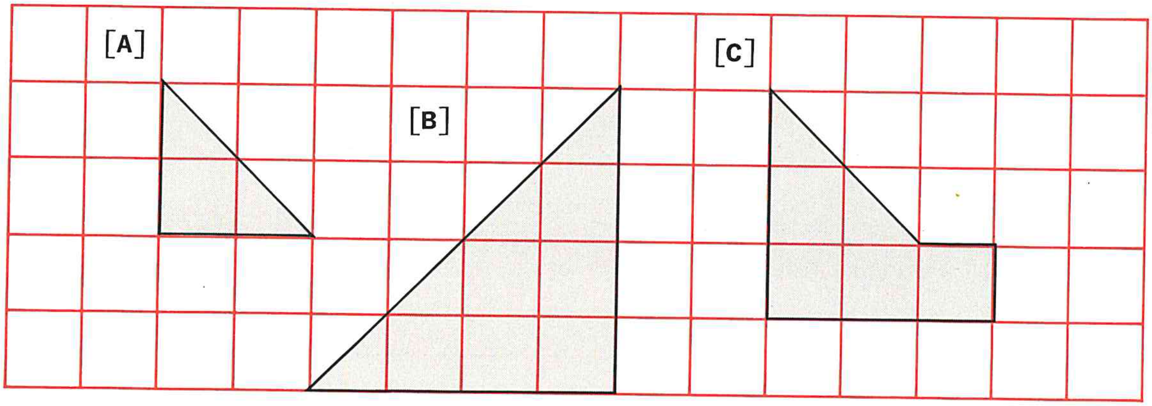


EXERCISES

1. The unit in these exercises is the square centimeter. Find the area of each shaded region.



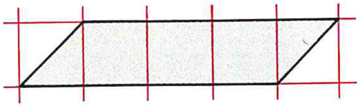
2. Find the area of each region.



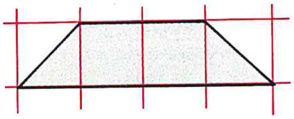
Area exercises

1. The units for these exercises are marked with the colored lines. Find the area of each shaded region.

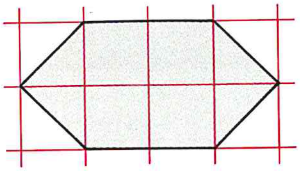
[A]



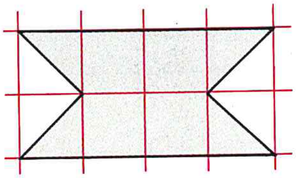
[B]



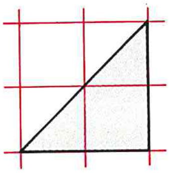
[C]



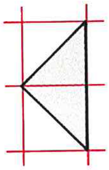
[D]



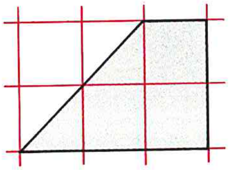
[E]



[F]

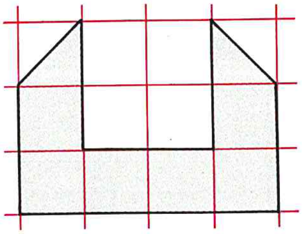


[G]

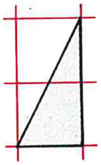


★ **2.** Find the area of each shaded region.

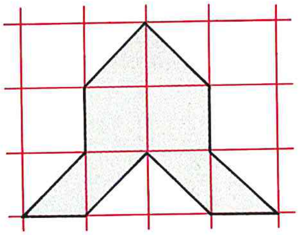
[A]



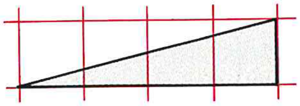
[B]



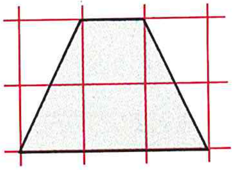
[C]



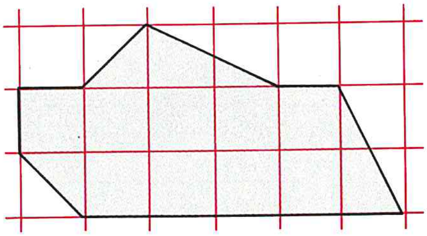
[D]



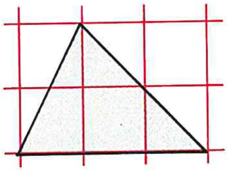
[E]



[F]



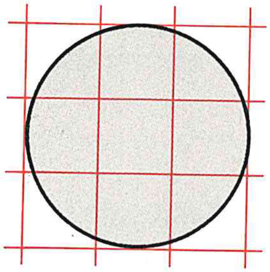
[G]



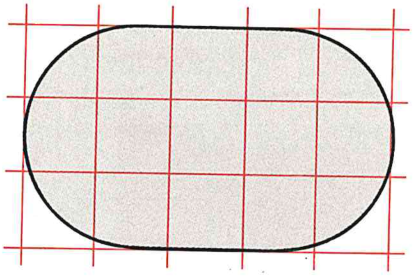
★ Estimating area

You will not be able to find the area of these figures **exactly.** Think carefully and estimate the area of each figure.

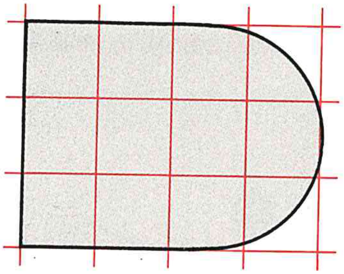
1.



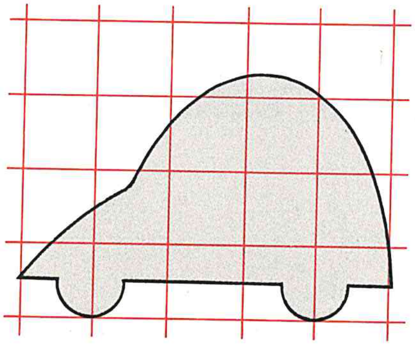
2.



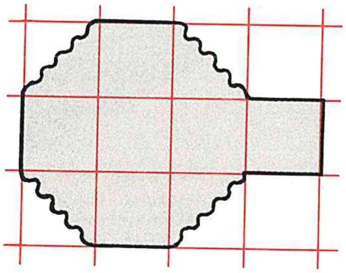
3.



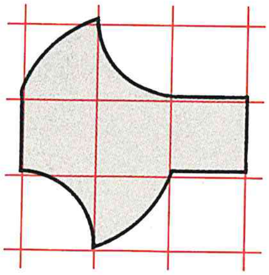
4.



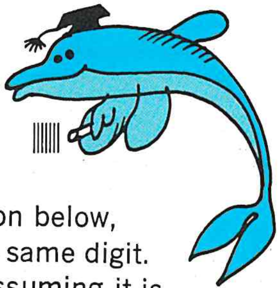
5.



6.



Think



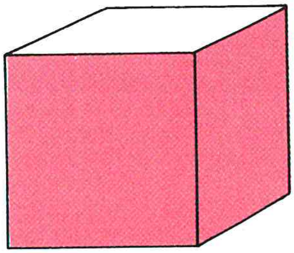
In each equation below, the ▥ covers the same digit. Find that digit assuming it is not 0.

1. ▥ × ▥ = ▥
2. ▥ × ▥ = 20 + ▥
3. ▥ × ▥ = 30 + ▥

Finding volume

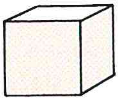
You can find volume by counting cubes. Some cubes often used for measuring are the cubic inch and the cubic centimeter.

Cubic inch



Each side is 1 square inch.

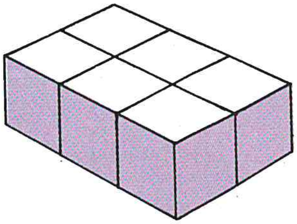
Cubic centimeter



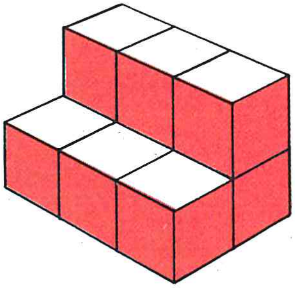
Each side is 1 square centimeter.

DISCUSSION EXERCISES

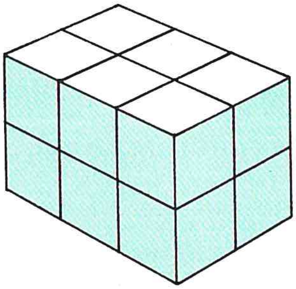
A



B



C



When looking at a figure and trying to count the cubes, you may have to think about cubes you cannot see.

1. Explain why the volume of figure A is 6.

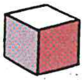
2. [A] Explain how you can "count" the units in figure B.

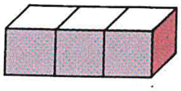
[B] What is the volume of figure B?

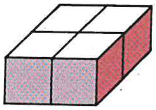
3. [A] Explain how you can "count" the units in figure C.

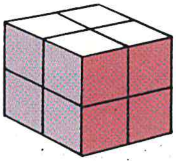
[B] What is the volume of figure C?

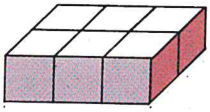
EXERCISES

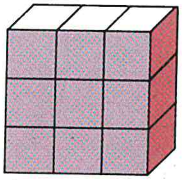
The unit used in these exercises is  . Find the number of cubic units (volume) in each figure.

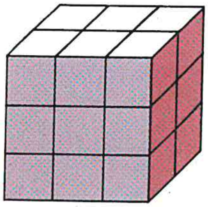
1. 

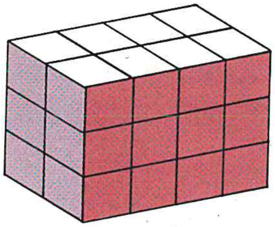
2. 

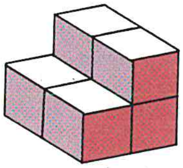
3. 

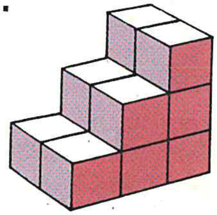
4. 

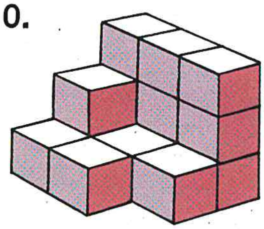
5. 

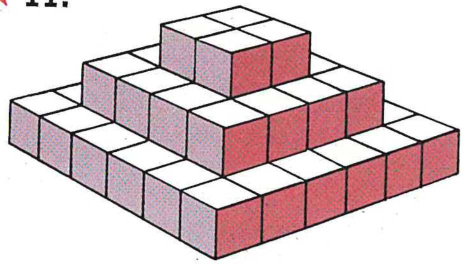
6. 

7. 

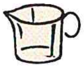
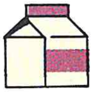
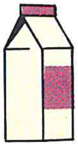
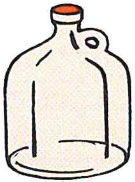
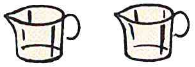
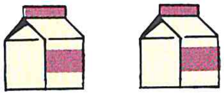
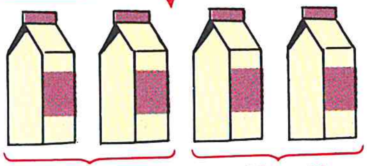
8. 

9. 

★ 10. 

★ 11. 

Liquid measure

Cup	Pint	Quart	Gallon
			
8 ounces	 2 cups	 2 pints	 half gallon half gallon 4 quarts

EXERCISES

1. Give the missing numbers.

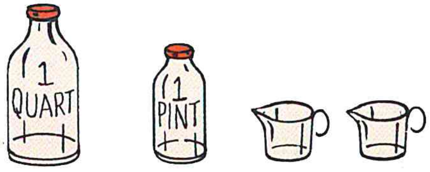
[A] 2 pints are ||||| cups.
[B] 1 quart is ||||| cups.
[C] 2 quarts are ||||| pints.
[D] 3 quarts are ||||| pints.
[E] 1 gallon is ||||| pints.
[F] $\frac{1}{2}$ cup is ||||| ounces.
[G] 2 cups are ||||| ounces.
[H] 1 pint is ||||| ounces.
[I] $\frac{1}{2}$ gallon is ||||| pints.
[J] 3 gallons 2 pints are ||||| quarts.

2. Tell which is more.

[A] 3 cups **or** 1 pint
[B] 12 ounces **or** 1 pint
[C] 1 quart **or** 3 pints
[D] 3 pints 15 ounces **or** 1 quart
[E] 2 quarts **or** 3 pints 1 cup
[F] 3 quarts 1 pint **or** 1 gallon
[G] 3 pints **or** 1 half gallon
[H] 4 quarts 1 pint **or** 1 gallon

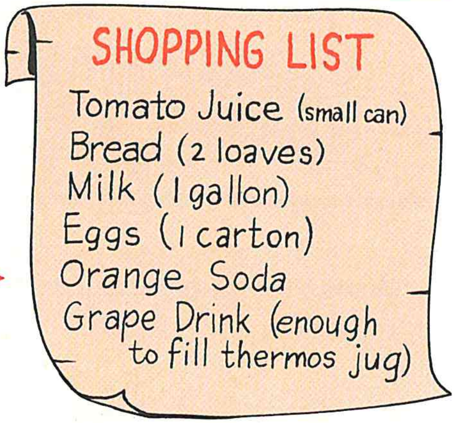
3. Sometimes milk comes in half-pint cartons. How many cups of milk do you drink when you drink a half pint of milk?

★ **4.** How much more do you need to fill a gallon jug after you have poured in the total amount shown?



Sally's shopping problems

Sally's mother asked her to go to the store. Here is her shopping list:

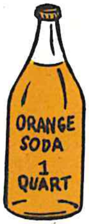


SHOPPING LIST

Tomato Juice (small can)
Bread (2 loaves)
Milk (1 gallon)
Eggs (1 carton)
Orange Soda
Grape Drink (enough to fill thermos jug)

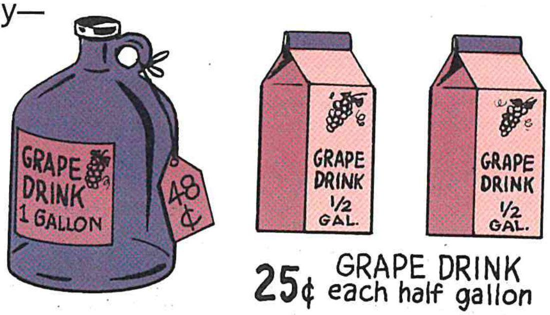
1. Sally picked up 3 quarts of milk. How much more should she get?

2. Sally knew that the orange soda was for her little brother's birthday party. If each of the 6 boys at the party drinks a pint of orange soda, how many quart bottles should Sally buy?

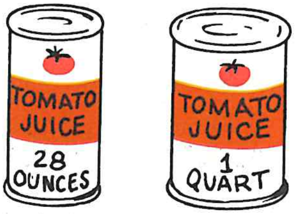


3. Sally bought a carton of six 16-ounce bottles. How many pints did she buy? How many quarts did she buy?

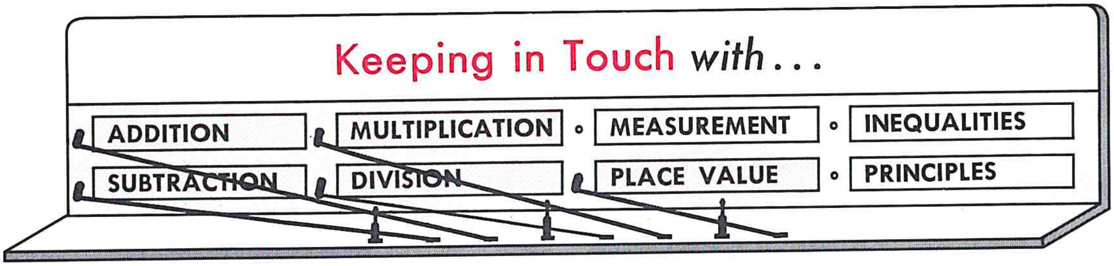
4. Sally's thermos jug holds 1 gallon. Which should Sally buy to save money—the gallon or the 2 half gallons?



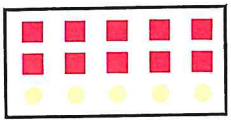
5. One can held 28 ounces of tomato juice. Another held 1 quart of tomato juice. Which can held more juice? How much more?



Keeping in Touch *with . . .*

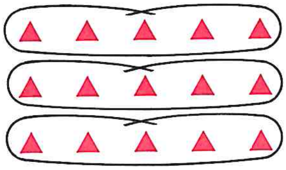


1. Write 2 addition and 2 subtraction equations for this set.

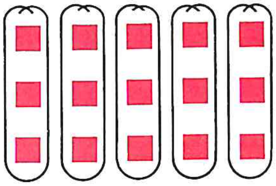


2. Write a multiplication equation for each exercise.

[A]

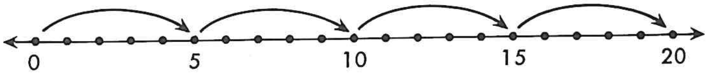


[B]



[C] $6 + 6 + 6 + 6 + 6$

[D]



3. Write 2 division equations for each exercise.

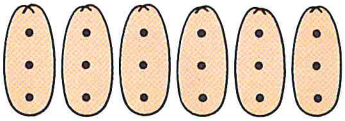
[A] $4 \times 5 = 20$

[B] $7 \times 9 = 63$

[C] $17 \times 28 = 476$

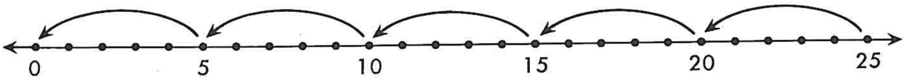
4. Write a division equation for each exercise.

[A]



[B] $\begin{array}{r}24\\ -4\\ \hline 20\end{array}$ $\begin{array}{r}20\\ -4\\ \hline 16\end{array}$ $\begin{array}{r}16\\ -4\\ \hline 12\end{array}$ $\begin{array}{r}12\\ -4\\ \hline 8\end{array}$ $\begin{array}{r}8\\ -4\\ \hline 4\end{array}$ $\begin{array}{r}4\\ -4\\ \hline 0\end{array}$

[C]



5. Find the products.

[A] $\begin{array}{r}7\\ \times 6\\ \hline\end{array}$ [B] $\begin{array}{r}8\\ \times 5\\ \hline\end{array}$ [C] $\begin{array}{r}3\\ \times 8\\ \hline\end{array}$ [D] $\begin{array}{r}9\\ \times 7\\ \hline\end{array}$ [E] $\begin{array}{r}5\\ \times 7\\ \hline\end{array}$ [F] $\begin{array}{r}4\\ \times 6\\ \hline\end{array}$ [G] $\begin{array}{r}6\\ \times 8\\ \hline\end{array}$ [H] $\begin{array}{r}7\\ \times 7\\ \hline\end{array}$

[I] $\begin{array}{r}9\\ \times 6\\ \hline\end{array}$ [J] $\begin{array}{r}7\\ \times 4\\ \hline\end{array}$ [K] $\begin{array}{r}4\\ \times 9\\ \hline\end{array}$ [L] $\begin{array}{r}9\\ \times 8\\ \hline\end{array}$ [M] $\begin{array}{r}7\\ \times 8\\ \hline\end{array}$ [N] $\begin{array}{r}8\\ \times 4\\ \hline\end{array}$ [O] $\begin{array}{r}8\\ \times 8\\ \hline\end{array}$ [P] $\begin{array}{r}5\\ \times 6\\ \hline\end{array}$

6. Give a number to complete each sentence.

[A] In 3654, the 6 stands for ▥.
[B] In 76,285, the 6 stands for ▥.
[C] In 327, the 2 stands for ▥.
[D] In 8603, the 8 stands for ▥.
[E] In 28,650, the 0 stands for ▥.
[F] In 9035, the 0 stands for ▥.
[G] In 37,643, the 7 stands for ▥.
[H] In 50,123, the 5 stands for ▥.
[I] In 7052, the 5 stands for ▥.
[J] In 86,347, the 8 stands for ▥.

7. Find the sums.

[A] 60,000 + 7000 + 800 + 20 + 3
[B] 20,000 + 3000 + 200 + 60 + 7
[C] 70,000 + 300 + 8
[D] 90,000 + 6000 + 700 + 20 + 8
[E] 300,000 + 60,000 + 9000

8. For these numbers, write sums as in exercise 7.

[A] 475
[B] 6280
[C] 90,306
[D] 127,000
[E] 283,000
[F] 700,800

9. Find the quotients. (For help, look at exercise 5.)

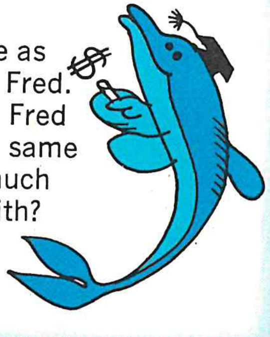
[A] 56 ÷ 8
[B] 63 ÷ 7
[C] 72 ÷ 8
[D] 49 ÷ 7
[E] 24 ÷ 8
[F] 32 ÷ 4
[G] 40 ÷ 5
[H] 35 ÷ 7
[I] 36 ÷ 9
[J] 24 ÷ 6
[K] 54 ÷ 6
[L] 48 ÷ 8
[M] 28 ÷ 4
[N] 64 ÷ 8
[O] 42 ÷ 6
[P] 30 ÷ 6

10. Find the sums and differences.

[A] $\begin{array}{r}27\\+44\\\hline\end{array}$
[B] $\begin{array}{r}64\\-31\\\hline\end{array}$
[C] $\begin{array}{r}24\\+65\\\hline\end{array}$
[D] $\begin{array}{r}64\\-34\\\hline\end{array}$
[E] $\begin{array}{r}64\\-38\\\hline\end{array}$
[F] $\begin{array}{r}59\\+63\\\hline\end{array}$
[G] $\begin{array}{r}47\\+56\\\hline\end{array}$
[H] $\begin{array}{r}93\\-26\\\hline\end{array}$
[I] $\begin{array}{r}127\\-54\\\hline\end{array}$
[J] $\begin{array}{r}141\\-95\\\hline\end{array}$
[K] $\begin{array}{r}65\\-19\\\hline\end{array}$
[L] $\begin{array}{r}48\\+16\\\hline\end{array}$

Think

Jack had twice as much money as Fred. When Jack gave Fred 5¢, they had the same amount. How much did Jack start with?



Chapter review

1. Bob takes steps about this long.

Sue's steps are just half as long.

[**A**] Who will take the most steps to cross the room?

[**B**] Who takes the longer step?

[**C**] If Bob takes 10 steps to cross the room, how many steps will Sue take?

[**D**] If Sue takes 12 steps from the door to the teacher's desk, how many steps will Bob take?

2. [**A**] Give the length of the segments using the inch as your unit.

[**B**] Measure the segments to the nearest half centimeter.

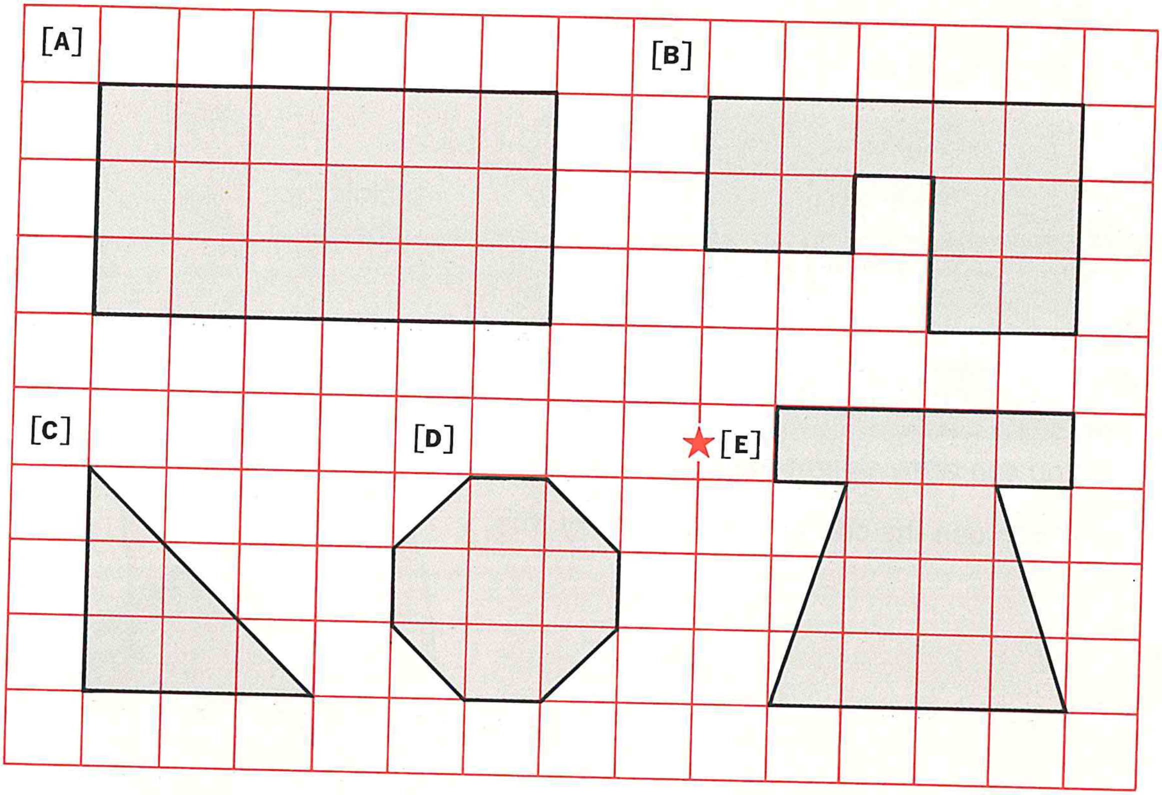
★ [**C**] Ted called his unit the twinch. Twinch Give the measure of these segments, using the twinch as your unit. Use your ruler if you like.

3. Does the inch or the centimeter give the larger number when you measure the same object?

4. [**A**] Is the inch longer than 2 centimeters?

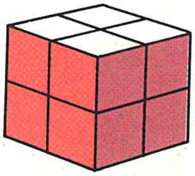
[**B**] Is the inch longer than 3 centimeters?

5. Using the square centimeter as your unit, give the area for each region.

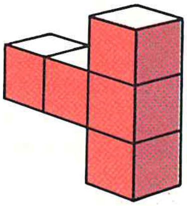


6. Give the volume of each figure below.

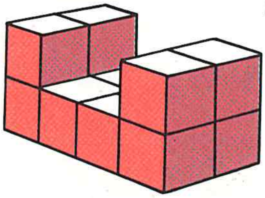
[A]



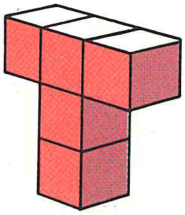
[B]



[C]

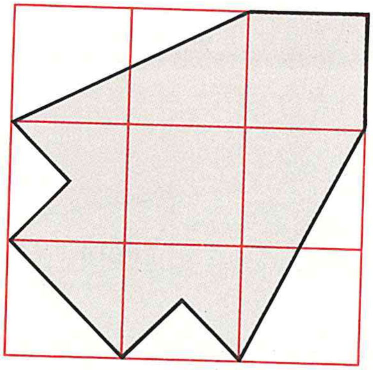


[D]



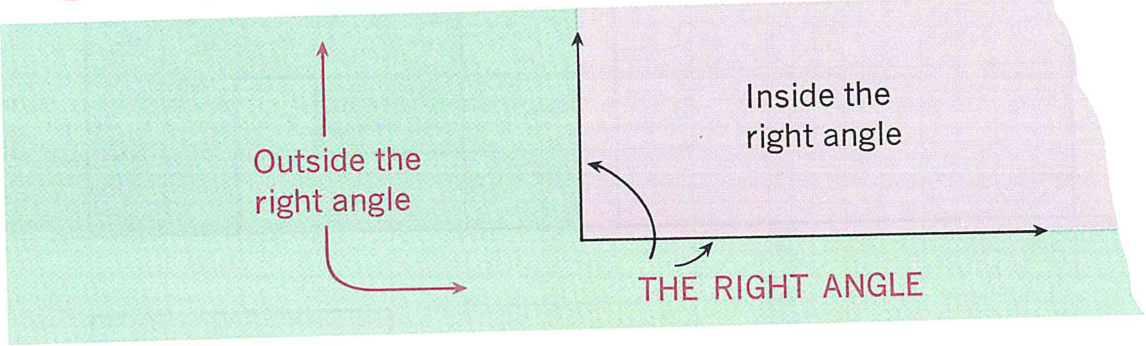
Think

Find the area of this region.



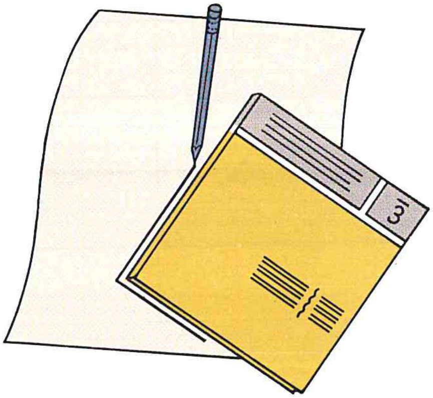
GEOMETRY Unit 3

Right angles



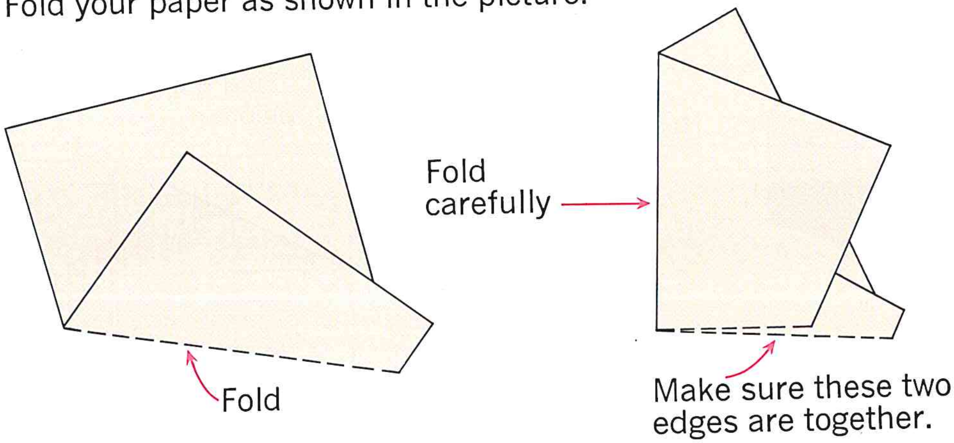
You can draw a right angle in many ways.

1. You can use the corner of a book. Try this.



2. You can use two folds in a paper.

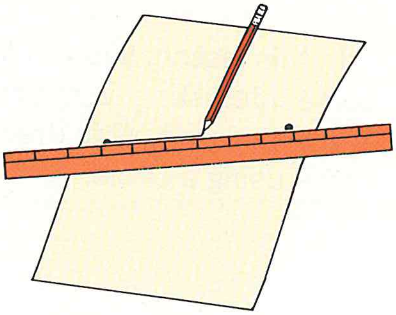
[A] Fold your paper as shown in the picture.


Fold
Fold carefully
Make sure these two edges are together.

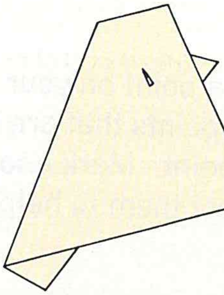
[B] Now open your paper and find a right angle. Trace over one of the right angles with your pencil. Use a corner of your book to see that you have a right angle.

3. You can use 2 points and 1 fold of the paper.

   [A] Mark 2 points on your paper.
   Use your ruler to connect the points.

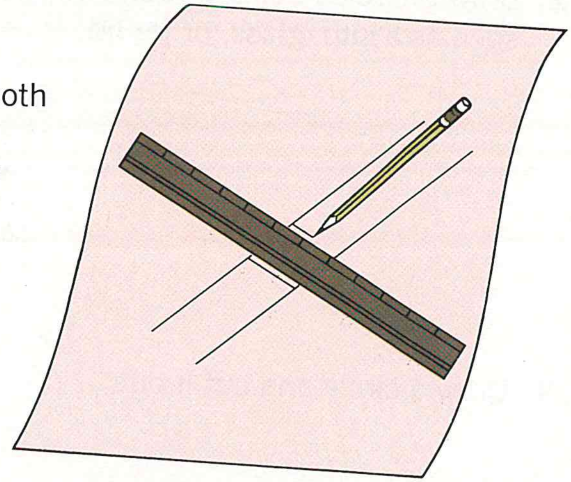


   [B] Put the point of your pencil through the 2 dots. Fold the paper carefully.



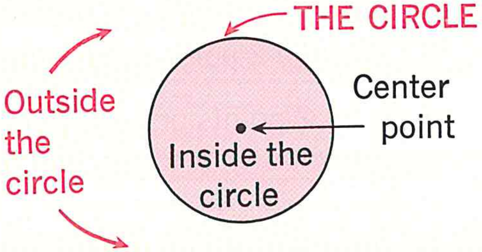
   [C] Now open the paper and find a right angle. Trace over the right angle with your pencil. Use a corner of your book to see that you have a right angle.

4. A **rhombus** is a parallelogram that has all 4 sides the same size. You can draw a rhombus by drawing on both sides of a wide ruler as in the figure. Draw a rhombus. Then draw the diagonals (connect opposite corners). Find a right angle.

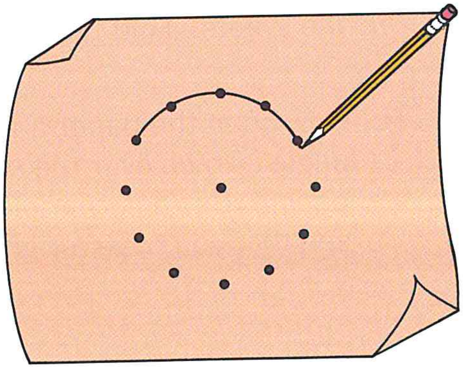


Circles and right angles

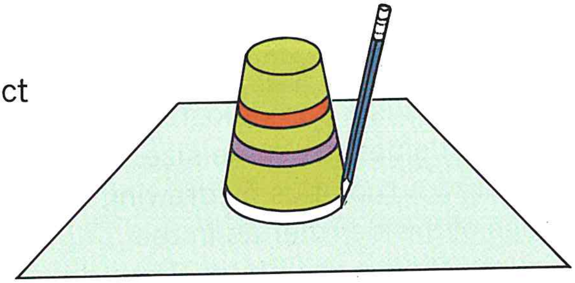
In this lesson, you will learn some interesting facts about circles. You will learn how to draw a right angle using a circle.



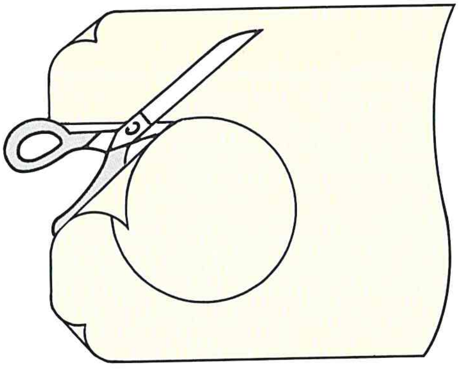
1. Mark a point on your paper. Mark many other points that are 1 inch from this first point. Mark enough points so you can connect them to help you draw a circle.



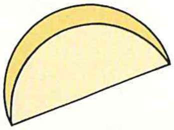
2. Draw 5 circles using a round object such as a cup, glass, or jar lid.

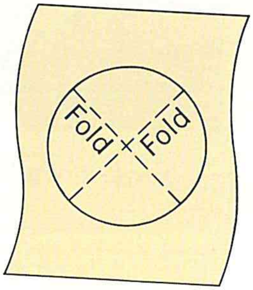


3. Draw a circle and cut it out.

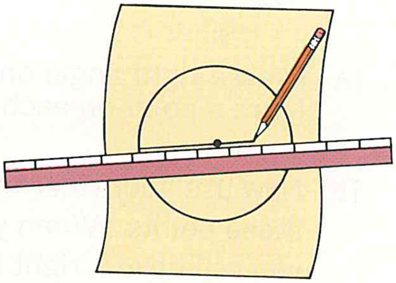


4. Fold your circle in half. Now fold it in half again making a second crease. Open the circle and paste it on a clean sheet of paper. Mark the point where the two creases cross. What point do you think this is?

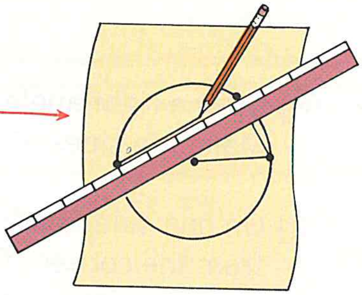




5. [A] Draw over one of the creases so that you have marked the center and a segment through the center.



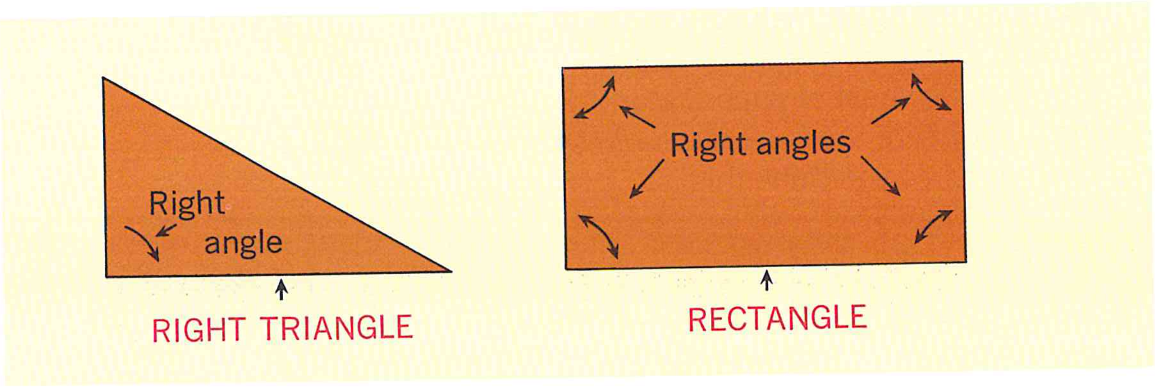
[B] Now mark a point on the circle. Use your ruler to connect the point to the ends of the segment.

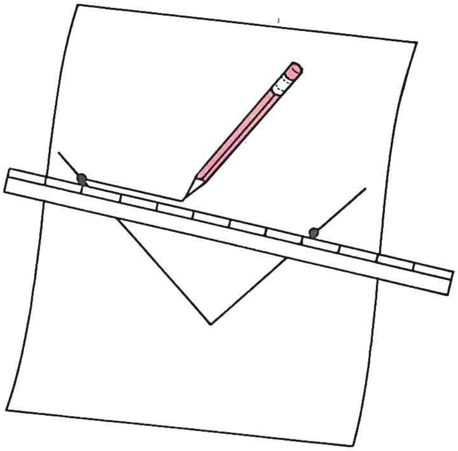


[C] Find the right angle. Use a corner of your book to see that it is a right angle.

[D] Try this again by marking a different point on the circle. Will this always give you a right angle?

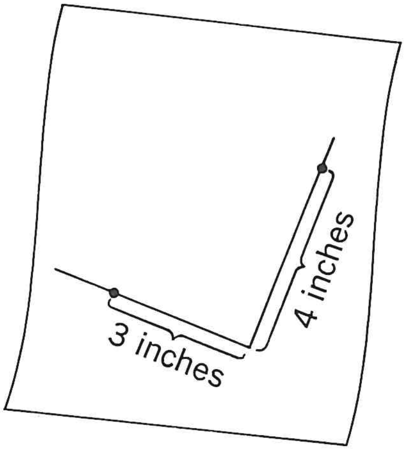
Right triangles and rectangles





1. [A] Draw a right angle on your paper. Mark a point on each side of the angle.

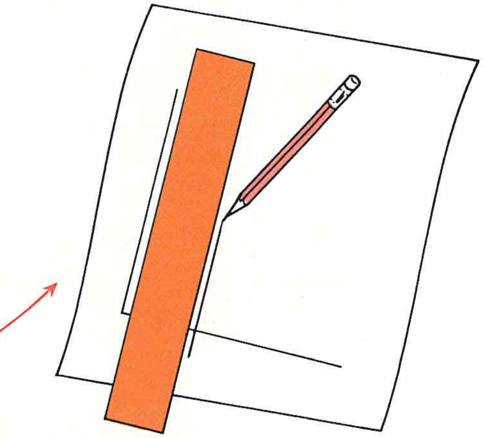
   [B] Now use your ruler to connect these points. When you finish, you will have a right triangle.



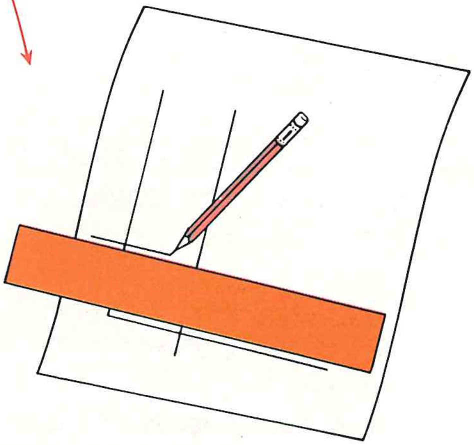
2. [A] Draw a right angle on your paper. Make the sides at least 4 inches long.

   [B] On one side, mark a point 3 inches from the corner. On the other side, mark a point 4 inches from the corner.

   [C] Connect these two points and measure this segment. If you did your work carefully, it should be 5 inches long.



3. [A] Draw a right angle on your paper. Use a wide ruler or a carefully folded paper to draw lines like this.

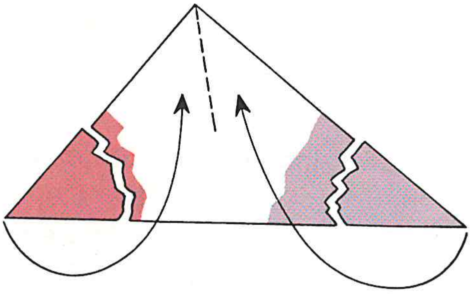


[B] When you finish, you should have a square. A square is a special kind of rectangle. Trace over the square with a red pencil or crayon. Use your ruler to see if all the sides have the same length. Use a corner of your book to see if all the angles are right angles.

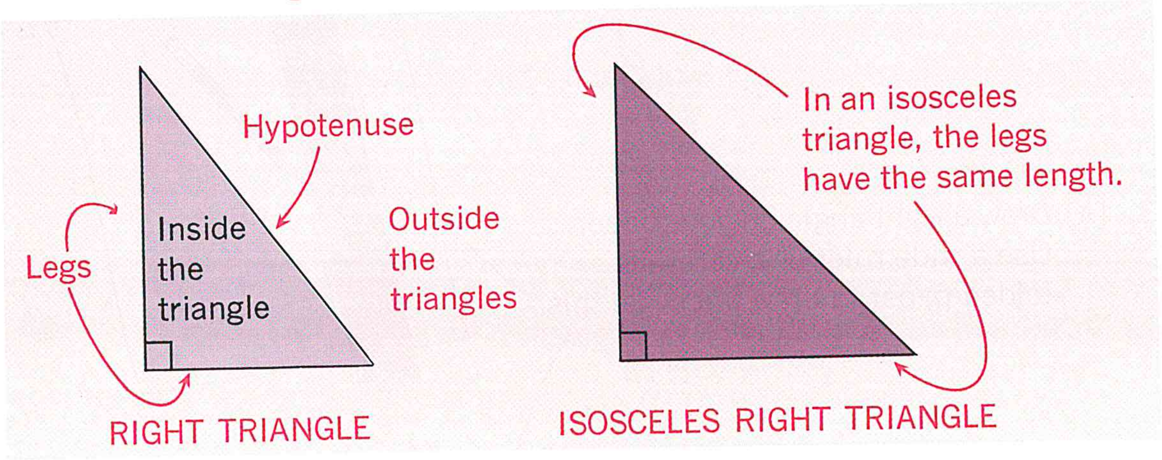
4. [A] Draw a right triangle. Color inside the two angles that are not right angles. Use a different color for each.

[B] Cut out the triangle and tear off the two corners you colored.

[C] Paste the corners over the right angle like this. Do your work carefully, and you will discover something interesting.

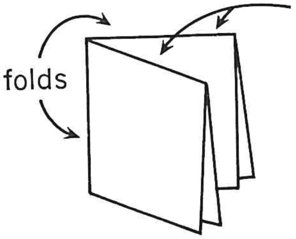


More about right triangles



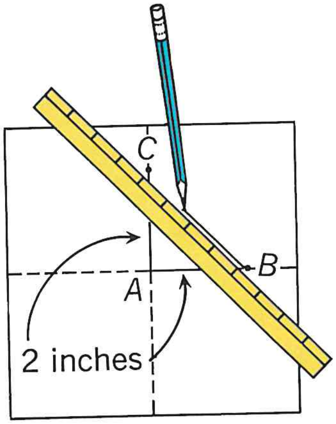
1. Draw an isosceles right triangle with 2-inch legs as follows.

   [**A**] Fold your paper as shown to help you draw a right angle.

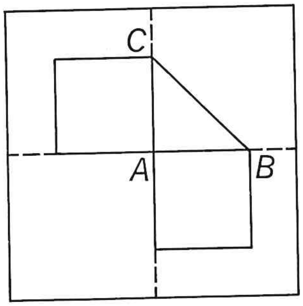


Be sure that these top edges fit upon each other.

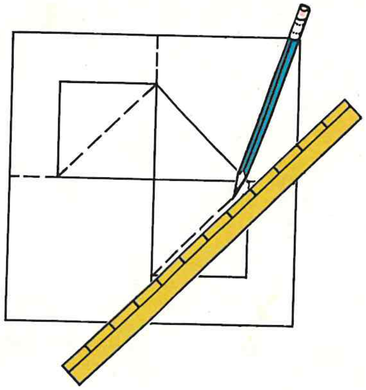
   [**B**] Unfold your paper and draw 2-inch segments *AB* and *AC*. Then complete the drawing of the isosceles right triangle as shown.



2. Draw 2-inch squares on each leg of the isosceles right triangle. You will need to make sure that each angle of the square is a right angle. You will need to use your ruler to make sure each side of the square is 2 inches long.

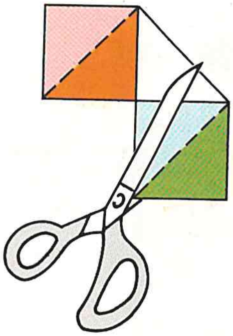


3. Draw diagonal line segments as shown.

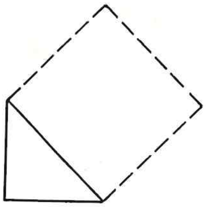


4. Use different colors to color the four parts of the 2-inch squares.

5. Now cut out each of the four colored pieces.



6. Figure out how to fit the four pieces together to form a square on the hypotenuse (as shown by the dotted line in the picture). Each side of the square you form should be the same length as the hypotenuse of the isosceles right triangle.



7. After you have figured out how to form the square on the hypotenuse, complete your work by pasting the four pieces in place.

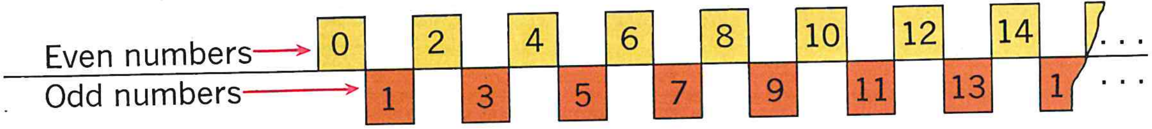
8. Draw an isosceles right triangle with 7-centimeter legs and try this experiment again.

9. Do you think the squares on the legs could be made to fit in the square on the hypotenuse for every isosceles right triangle?

CHAPTER 7 Number Theory

Even and odd numbers

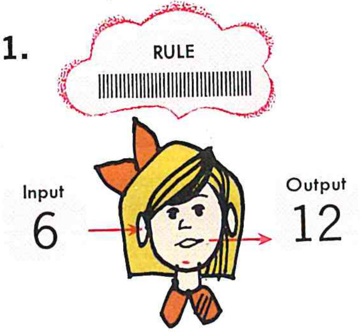
We separate the whole numbers into two sets.

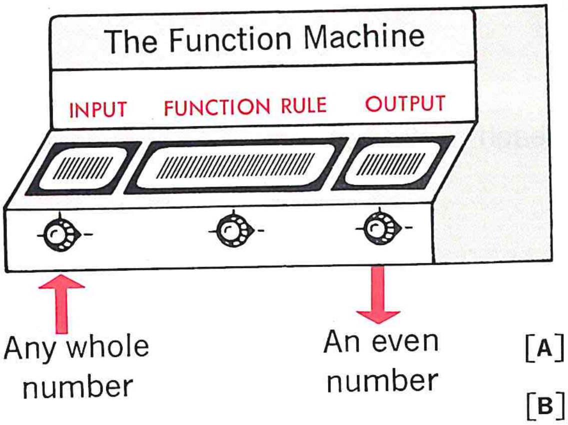


DISCUSSION EXERCISES

Try to discover the function rule. Then give the missing numbers.

1.

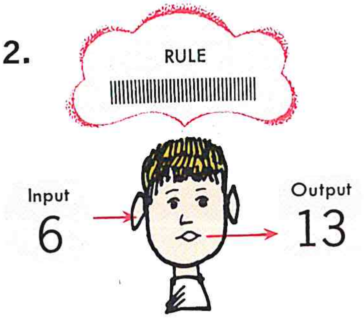


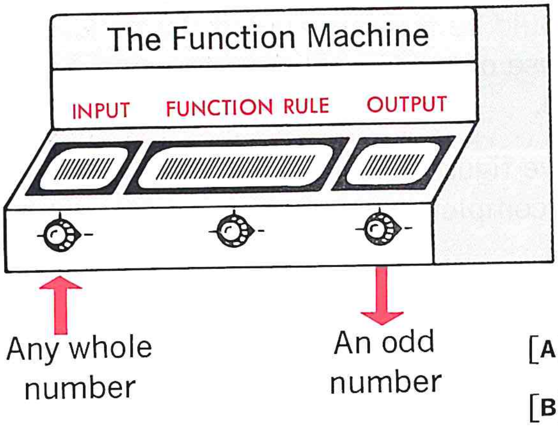


Function Rule

	Input	Output
	1	2
	2	4
	3	6
	4	8
[A]	7	
[B]	9	

2.



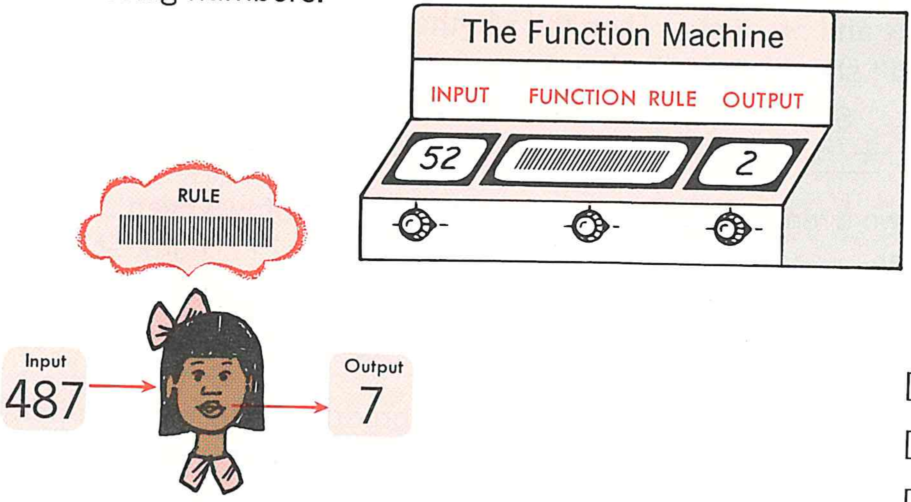


Function Rule

	Input	Output
	1	3
	2	5
	3	7
	4	9
[A]	7	
[B]	9	

EXERCISES

1. Look at the picture below. Then study the table and give the missing numbers.



Function Rule ▥

	Input	Output
	19	9
	20	0
	76	6
[A]	45	▥
[B]	960	▥
[C]	871	▥
[D]	408	▥

2. Study the examples. Then complete the exercises.

Examples:

457 ends with 7. 457 is an odd number.

786 ends with 6. 786 is an even number.

[A] 34 ends with ▥. Is 34 an even or odd number?
[B] 43 ends with ▥. Is 43 an even or odd number?
[C] 27 ends with ▥. Is 27 an even or odd number?
[D] 56 ends with ▥. Is 56 an even or odd number?
[E] 30 ends with ▥. Is 30 an even or odd number?
[F] 81 ends with ▥. Is 81 an even or odd number?
[G] 138 ends with ▥. Is 138 an even or odd number?
[H] 469 ends with ▥. Is 469 an even or odd number?

3. Answer "even" or "odd."

[A] Each _?_ number ends with 0, 2, 4, 6, or 8.
[B] Each _?_ number ends with 1, 3, 5, 7, or 9.

4. Answer "even" or "odd" for each number.

[A] 84
[B] 34
[C] 27
[D] 772
[E] 999
[F] 763
[G] 1000
[H] 9284
[I] 52,648
[J] 586,345

Sums and products—even or odd

DISCUSSION EXERCISES

Find the sums and products. Then tell whether "even" or "odd" should go in the blank.

1. $\begin{array}{r} 6 \\ +8 \\ \hline \end{array}$ $\begin{array}{r} 16 \\ +28 \\ \hline \end{array}$ $\begin{array}{r} 60 \\ +78 \\ \hline \end{array}$ $\begin{array}{r} 78 \\ +54 \\ \hline \end{array}$

The sum of two even numbers is an _?_ number.

2. $\begin{array}{r} 5 \\ +7 \\ \hline \end{array}$ $\begin{array}{r} 15 \\ +1 \\ \hline \end{array}$ $\begin{array}{r} 37 \\ +45 \\ \hline \end{array}$ $\begin{array}{r} 65 \\ +87 \\ \hline \end{array}$

The sum of two odd numbers is an _?_ number.

3. $\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$ $\begin{array}{r} 47 \\ +6 \\ \hline \end{array}$ $\begin{array}{r} 38 \\ +11 \\ \hline \end{array}$ $\begin{array}{r} 57 \\ +38 \\ \hline \end{array}$

The sum of an even and an odd number is an _?_ number.

4. $\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$

The product of two even numbers is an _?_ number.

5. $\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 1 \\ \times 7 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$

The product of two odd numbers is an _?_ number.

6. $\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$

The product of an even and an odd number is an _?_ number.

EXERCISES

Answer "even" or "odd."

1. The sum of an even number and 1 is an _?_ number.
2. The product of an even number and 1 is an _?_ number.
3. The sum of an odd number and 1 is an _?_ number.
4. The product of an odd number and 1 is an _?_ number.
5. No _?_ number is less than 1.
6. Every _?_ number is greater than 0.
7. There are two _?_ numbers less than 3.
8. There is only one _?_ number less than 3.
9. The sum of 0 and an odd number is an _?_ number.
10. The product of 0 and an odd number is an _?_ number.
11. The sum of an even number and 0 is an _?_ number.
12. The product of an even number and 0 is an _?_ number.
13. The sum of two odd numbers is an _?_ number.
14. The product of two odd numbers is an _?_ number.
15. The sum of an even and an odd number is an _?_ number.
16. The product of an even and an odd number is an _?_ number.

Multiples

	×	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	
B	3	0	3	6	9	12	15	18	21	24	27	30	33	36	39	
C	4	0	4	8	12	16	20	24	28	32	36	40	44	48	5	

The numbers in row **A,** {0, 2, 4, 6, . . .}, are multiples of 2.
The numbers in row **B,** {0, 3, 6, 9, . . .}, are multiples of 3.
The numbers in row **C,** {0, 4, 8, 12, . . .}, are multiples of 4.

DISCUSSION EXERCISES

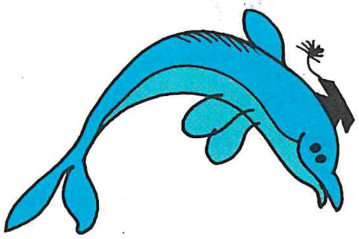
1. 8 is a multiple of 2. 8 is also a multiple of |||||.
2. 6 is a multiple of both ||||| and |||||.
3. Find a number (other than zero) that is a multiple of both 3 and 4.
4. Find a number in the table that is a multiple of 2, 3, and 4.
   Find another such number.
5. Give some numbers that are multiples of 5.
6. Why is 18 a multiple of 6?

EXERCISES

1. [A] List the multiples of 5 (through 50).
   [B] List the multiples of 6 (through 60).
   [C] List the multiples of 7 (through 70).
   [D] List the multiples of 8 (through 80).
   [E] List the multiples of 9 (through 90).
2. Find the missing numbers.
   [A] Since 3 × 4 = 12,
   12 is a multiple of both 3 and |||||.
   [B] Since 5 × 6 = 30,
   30 is a multiple of both ||||| and 6.
   [C] Since 7 × 8 = 56,
   56 is a multiple of both ||||| and |||||.

Think

Of the numbers with 2 digits,
I'm the smallest with this fate.
I'm a multiple of six
And a multiple of eight.



WHO AM I?

Factors

$3 \times 4 = 12$

Both 3 and 4 are **factors** of 12.

12 is a multiple of both 3 and 4.

$7 \times 8 = 56$

Both 7 and 8 are **factors** of 56.

56 is a multiple of both 7 and 8.

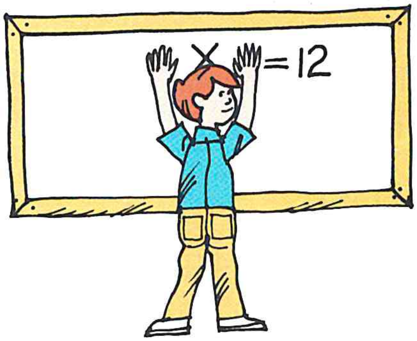
$5 \times 9 = 45$

Both 5 and 9 are **factors** of 45.

45 is a multiple of both 5 and 9.

DISCUSSION EXERCISES

John is covering up two factors of 12.



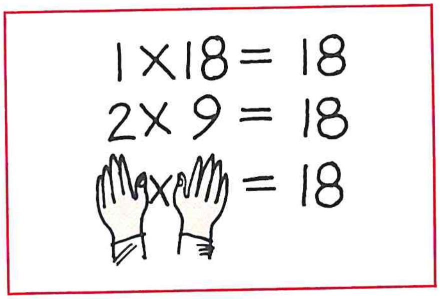
1. Can you tell what these factors are?
2. Give a pair of numbers that John might be hiding.
3. Write three equations, using different factors that might be on the board.
4. List six numbers that are factors of 12.
5. Is 5 a factor of 12? Why?

EXERCISES

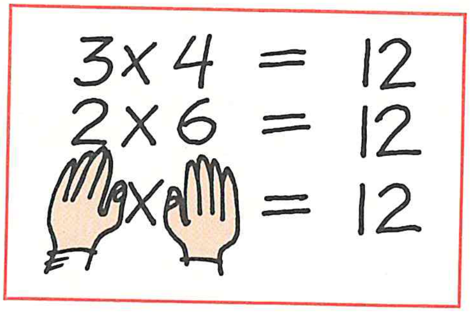
1. [A] Write a third equation to show other factors of 18.

   [B] List six different factors of 18.

   [C] Is 4 a factor of 18?

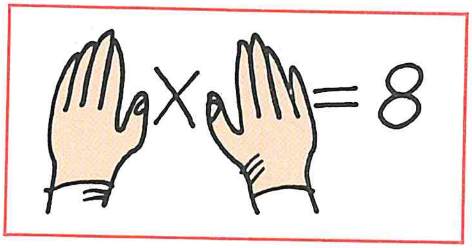


2. [A] Write a third equation to show other factors of 12.
[B] List six different factors of 12.
[C] Is 8 a factor of 12?



3. For each exercise, write as many equations as you need to show all the factors of the product.

[A]



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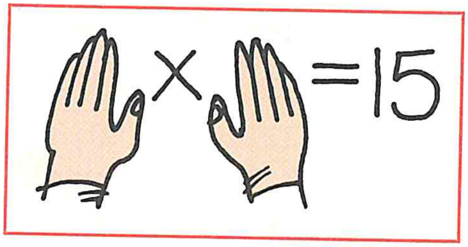

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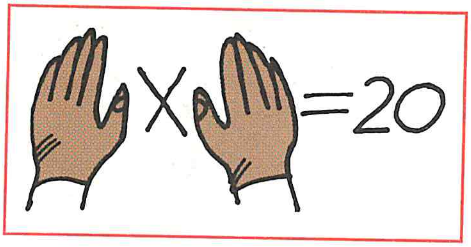
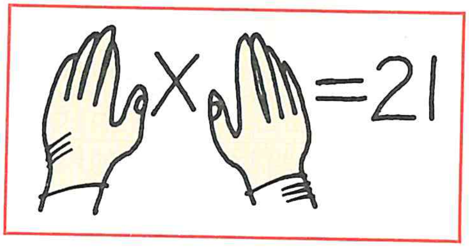


[D]



4. List all the factors of each number. Use exercise 3 if you need help.
[A] 8 [B] 15 [C] 20 [D] 21

5. [A] Which equation below has a whole number solution?
① $16 \div 3 = \boxed{n}$ ② $16 \div 4 = \boxed{n}$ ③ $16 \div 5 = \boxed{n}$

[B] Which of the numbers {3, 4, 5} is a factor of 16?

★ 6. Which of the numbers {2, 3, 4, 5, 6} are factors of:

[A] 15? (Answer: 3 and 5)

[B] 10? [F] 24? [J] 32?
[C] 8? [G] 28? [K] 25?
[D] 9? [H] 30? [L] 49?
[E] 20? [I] 31? [M] 60?

Think

I'm proud to be a factor of
Both twelve and forty-two.
No larger number makes this claim.
You need no other clue.

WHO AM I?

Prime numbers

This is an ordinary multiplication table with the 0 row and column and the 1 row and column left out.

×	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	
3	6	9	12	15	18	21	24	27	30	33	36	39	42		
4	8	12	16	20	24	28	32	36	40	44	48	52			
5	10	15	20	25	30	35	40	45	50	55	60				
6	12	18	24	30	36	42	48	54	60	66					
7	14	21	28	35	42	49	56	63	70						
8	16	24	32	40	48	56	64	72							
9	18	27	36	45	54	63	72								
10	20	30	40	50	60	70									
11	22	33	44	55	66										
12	24	36	48	60											
13	26	39	52												
14	28	42													
15	30														
16															

Think of this table as going on without end.

DISCUSSION EXERCISES

1. 7 is not one of the products in the table. Can you explain why?
2. 13 is not one of the products. Why?
3. 29 is not one of the products. Why?
4. Name some other numbers that are not one of the products.
5. Write all the whole numbers from 2 to 32.

   2, 3, 4, 5, 6, . . . 30, 31, 32.

   Now mark out the numbers that are products in the table above. What you have left is the set of all prime numbers less than 32.

EXERCISES

1. Complete each sentence with an equation.

   I know that 20 is **not prime** because 4 × 5 = 20.

   [A] I know that 12 is **not prime** because ▥ × ▥ = 12.

   [B] I know that 14 is **not prime** because ▥ × ▥ = 14.

   [C] I know that 24 is **not prime** because ▥ × ▥ = 24.

2. Tell whether each number is prime or not prime.

   [A] 15 [B] 17 [C] 19 [D] 21 [E] 23

3. Copy each equation, giving the missing numbers.

   [A] ▥ × ▥ = 2 [B] ▥ × ▥ = 3 [C] ▥ × ▥ = 5

4. Could you find a different pair of factors for any part of exercise 3?

5. [A] 2 is a prime number. What are the factors of 2?

   [B] 3 is a prime number. What are the factors of 3?

   [C] 5 is a prime number. What are the factors of 5?

   [D] How many different factors does a prime number have?

6. List all the factors of each of the following numbers.

   [A] 7 [B] 1 [C] 13 [D] 17 [E] 19

★ 7. List all prime numbers less than 50.

★ 8. Give the correct number or word.

   [A] The number ▥ is a factor of every number.

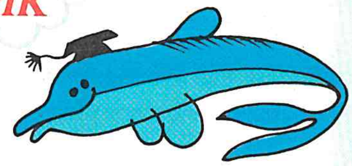
   [B] Each prime number has exactly ▥ factors.

   [C] The factors of a prime number are the number itself and ▥.

   [D] The number ▥ has exactly one factor.

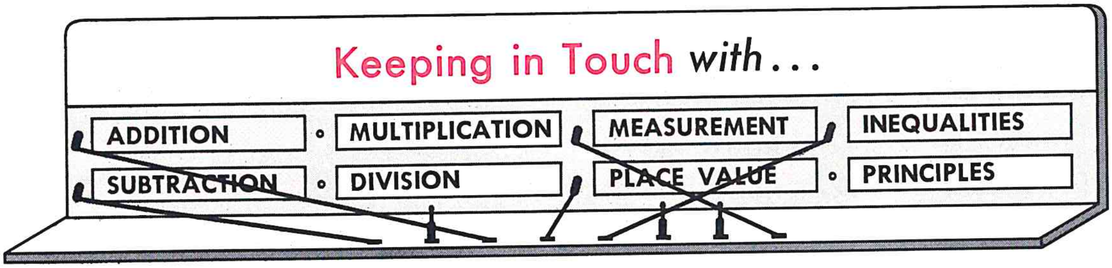
   [E] If a number has more than two factors, it is not a __?__ number.

Think



Now I'm a strange prime number.
No others are like me.
All my cousins are so odd,
As odd, as odd can be.

WHO AM I?



1. Solve the equations.

[A] $84 = 80 + \boxed{n}$ [B] $384 = 300 + 80 + \boxed{n}$ [C] $58 = \boxed{n} + 8$

[D] $458 = \boxed{n} + 50 + 8$ [E] $763 = 700 + \boxed{n} + 3$

2. Find the sums and differences.

[A] $\begin{array}{r}24\\+35\\\hline\end{array}$ [B] $\begin{array}{r}78\\-26\\\hline\end{array}$ [C] $\begin{array}{r}42\\+30\\\hline\end{array}$ [D] $\begin{array}{r}79\\-20\\\hline\end{array}$ [E] $\begin{array}{r}65\\+18\\\hline\end{array}$ [F] $\begin{array}{r}94\\-56\\\hline\end{array}$

[G] $\begin{array}{r}38\\+27\\\hline\end{array}$ [H] $\begin{array}{r}54\\-19\\\hline\end{array}$ [I] $\begin{array}{r}76\\+88\\\hline\end{array}$ [J] $\begin{array}{r}134\\-75\\\hline\end{array}$ [K] $\begin{array}{r}84\\+16\\\hline\end{array}$ [L] $\begin{array}{r}100\\-23\\\hline\end{array}$

3. Solve the equations.

[A] $7 + \boxed{n} = 15$ [B] $16 - 9 = \boxed{n}$ [C] $13 - 7 = \boxed{n}$

[D] $\boxed{n} + 5 = 12$ [E] $10 - 4 = \boxed{n}$ [F] $6 + \boxed{n} = 14$

4. Give the sign $>$, $<$, or $=$ for each ●.

[A] 482 ● 472 [B] 6286 ● 6296 [C] $50 + 8$ ● $50 - 8$

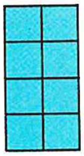
[D] $70 - 2$ ● $70 - 3$ [E] $70 + 4$ ● $70 + 5$ [F] $80 + 0$ ● $80 - 0$

5. Measure each segment to the nearest inch.

[A] [B]

[C]

6. Find the area of each region.

[A]


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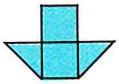

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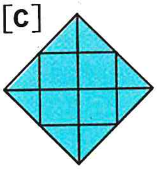
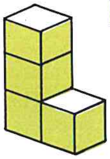


7. Find the volume of each region.

[A]


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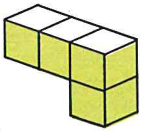

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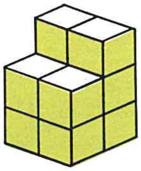


Chapter review

1. Which numbers are even and which are odd?

[A] 6 [B] 9 [C] 5 [D] 12 [E] 32 [F] 31 [G] 146 [H] 283

2. Find the missing numbers.

[A] 14 is a multiple of 2 because $2 \times 7 = \boxed{n}$.
[B] 12 is a multiple of 3 because $\boxed{n} \times 4 = 12$.
[C] Since $4 \times 6 = 24$, we call ▥ a multiple of 4.
[D] Since $\boxed{n} \times 12 = 36$, we call 36 a multiple of 3.
[E] Since $5 \times 6 = 30$, we know that ▥ is a multiple of 5.
[F] 45 is a multiple of 5 since $5 \times 9 = \boxed{n}$.

3. Find the missing numbers.

[A] ▥ and ▥ are factors of 18 because $3 \times 6 = 18$.
[B] 2 and 9 are factors of ▥ because $2 \times \boxed{n} = 18$.
[C] Since $4 \times 5 = 20$, ▥ and ▥ are factors of 20.
[D] Since $2 \times 3 \times 4 = 24$, 2, 3, and 4 are factors of ▥.
[E] Since $21 \div 3 = 7$, ▥ and ▥ are factors of 21.
[F] ▥ and ▥ are factors of 28 since $4 \times 7 = 28$.
[G] ▥ and ▥ are factors of 78 since $78 \div 6 = 13$.

4. List the factors of the following numbers.

[A] 6 [B] 5 [C] 9 [D] 10 [E] 11 [F] 12 [G] 20 [H] 29

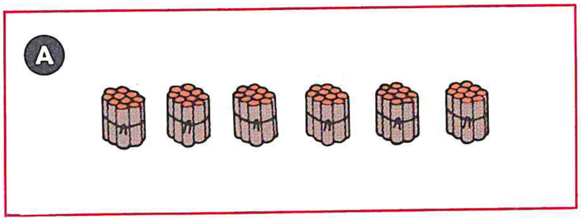
★ 5. Give the digits.

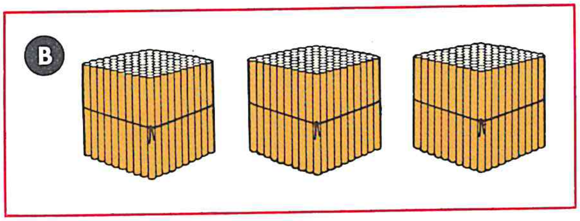
[A] If a number is a multiple of 2, then it ends in one of the digits ▥, ▥, ▥, ▥, or ▥.
[B] If a number is a multiple of 5, then it ends in one of the digits ▥ or ▥.
[C] The multiples of 3 may end in any one of the digits 0 to 9. Show this by listing the first ten multiples of 3.
[D] What other numbers between 1 and 10 have multiples that may end in any one of the digits 0 to 9?

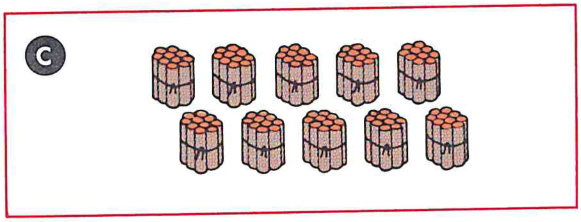
CHAPTER 8 Multiplying

Factors of 10 and 100

DISCUSSION EXERCISES







1. [A] How many sets of 10 are in box A?
   [B] Write the numeral for 6 tens.
   [C] Solve: $6 \times 10 = \boxed{n}$

2. [A] How many sets of 100 are in box B?
   [B] Write the numeral for 3 hundreds.
   [C] Solve: $3 \times 100 = \boxed{n}$

3. [A] How many sets of 10 are in box C?
   [B] Write the numeral for 10 tens.
   [C] Solve: $10 \times 10 = \boxed{n}$

4. Give the products orally.

[A] 5×10
[B] 7×100
[C] 1×10
[D] 2×10
[E] 4×100
[F] 0×10
[G] 8×100
[H] 9×10
[I] 10×10
[J] 4×10
[K] 5×100
[L] 9×100
[M] 7×10
[N] 8×10
[O] 2×100
[P] 3×10
[Q] 3×100
[R] 6×10
[S] 1×100
[T] 6×100

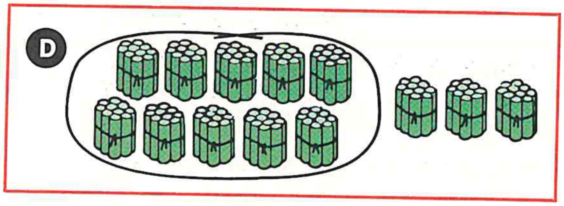
EXERCISES

Solve the equations.

1. $6 \times 10 = \boxed{n}$
2. $3 \times 10 = \boxed{n}$
3. $4 \times 100 = \boxed{n}$
4. $7 \times 10 = \boxed{n}$
5. $9 \times 100 = \boxed{n}$
6. $\boxed{n} \times 10 = 50$
7. $\boxed{n} \times 100 = 300$
8. $\boxed{n} \times 10 = 40$
9. $\boxed{n} \times 100 = 600$
10. $\boxed{n} \times 100 = 800$
11. $4 \times \boxed{n} = 40$
12. $6 \times \boxed{n} = 600$
13. $7 \times \boxed{n} = 70$
14. $3 \times \boxed{n} = 300$
15. $2 \times \boxed{n} = 200$

DISCUSSION EXERCISES

1. [A] How many sets of 10 sticks are in box D?
   [B] For 13 tens, we can think 10 tens and $\boxed{}$ tens.
   [C] Write the numeral for 10 tens.
   [D] Write the numeral for 3 tens.
   [E] Solve: $100 + 30 = \boxed{n}$
   [F] Write the numeral for 13 tens.
   [G] Solve: $13 \times 10 = \boxed{n}$



2. [A] For 16 tens, we can think 10 tens and $\boxed{}$ tens.
   [B] Solve: $16 \times 10 = \boxed{n}$

3. [A] For 12 tens, we can think $\boxed{}$ tens and $\boxed{}$ tens.
   [B] Solve: $12 \times 10 = \boxed{n}$

EXERCISES

1. Solve the equations.

[A] $11 \times 10 = \boxed{n}$
[B] $15 \times 10 = \boxed{n}$
[C] $10 \times 10 = \boxed{n}$
[D] $19 \times 10 = \boxed{n}$
[E] $17 \times 10 = \boxed{n}$
[F] $8 \times 10 = \boxed{n}$
[G] $12 \times 10 = \boxed{n}$
[H] $18 \times 10 = \boxed{n}$
[I] $6 \times 10 = \boxed{n}$
[J] $16 \times 10 = \boxed{n}$
[K] $3 \times 10 = \boxed{n}$
[L] $13 \times 10 = \boxed{n}$

2. Solve the equations.

[A]
$$\begin{aligned} 3 \times 100 &= \boxed{n} \\ 3 \times (10 \times 10) &= \boxed{n} \\ (3 \times 10) \times 10 &= \boxed{n} \\ 30 \times 10 &= \boxed{n} \end{aligned}$$

[B]
$$\begin{aligned} 6 \times 100 &= \boxed{n} \\ 6 \times (10 \times 10) &= \boxed{n} \\ (6 \times 10) \times 10 &= \boxed{n} \\ 60 \times 10 &= \boxed{n} \end{aligned}$$

[C]
$$\begin{aligned} 5 \times 100 &= \boxed{n} \\ 5 \times (10 \times 10) &= \boxed{n} \\ (5 \times 10) \times 10 &= \boxed{n} \\ 50 \times 10 &= \boxed{n} \end{aligned}$$

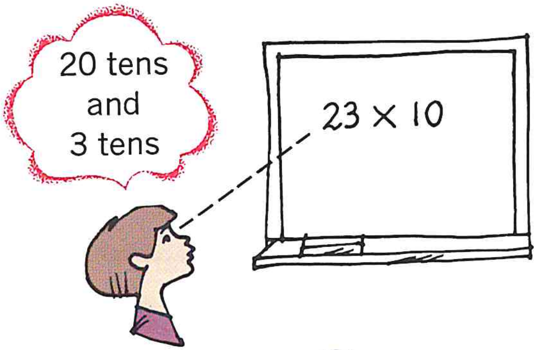
[D]
$$\begin{aligned} 8 \times 100 &= \boxed{n} \\ 8 \times (10 \times 10) &= \boxed{n} \\ (8 \times 10) \times 10 &= \boxed{n} \\ 80 \times 10 &= \boxed{n} \end{aligned}$$

3. Find the products.

[A] 30 × 10
[B] 60 × 10
[C] 50 × 10
[D] 80 × 10
[E] 20 × 10
[F] 10 × 10
[G] 12 × 10
[H] 40 × 10
[I] 2 × 10
[J] 20 × 10
[K] 7 × 10
[L] 70 × 10
[M] 3 × 10
[N] 13 × 10
[O] 30 × 10
[P] 3 × 100
[Q] 9 × 100
[R] 9 × 10
[S] 19 × 10
[T] 90 × 10

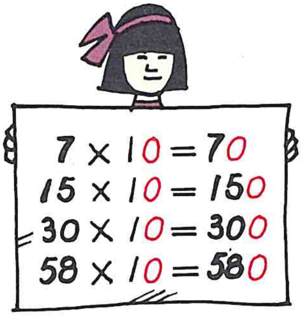
Multiplying by 10

DISCUSSION EXERCISES



1. [A] Explain how Jack is thinking about 23 × 10.
   [B] Write the numeral for 20 tens.
   [C] Write the numeral for 3 tens.
   [D] Solve: 23 × 10

2. Jill knows a shortcut for multiplying by ten. She made a chart to help the other children discover her rule.
   [A] What is Jill's rule for multiplying by 10?
   ★ [B] What is a simple rule for multiplying by 100?



EXERCISES

1. Solve the equations.

[A] $(40 \times 10) + (3 \times 10) = \boxed{n}$
$43 \times 10 = \boxed{n}$

[B] $(70 \times 10) + (2 \times 10) = \boxed{n}$
$72 \times 10 = \boxed{n}$

[C] $(30 \times 10) + (1 \times 10) = \boxed{n}$
$31 \times 10 = \boxed{n}$

[D] $(60 \times 10) + (5 \times 10) = \boxed{n}$
$65 \times 10 = \boxed{n}$

[E] $(20 \times 10) + (9 \times 10) = \boxed{n}$
$29 \times 10 = \boxed{n}$

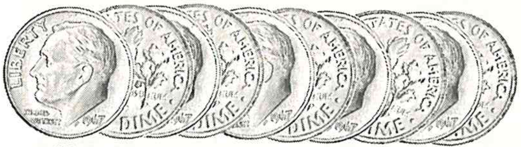
[F] $(50 \times 10) + (6 \times 10) = \boxed{n}$
$56 \times 10 = \boxed{n}$

2. Find the products.

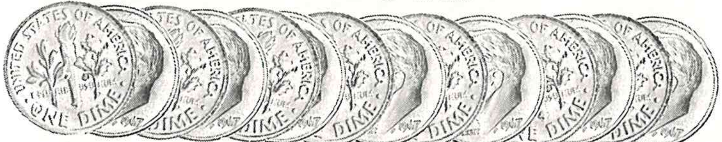
[A] 24 × 10
[B] 36 × 10
[C] 10 × 24
[D] 10 × 36
[E] 75 × 10
[F] 37 × 10
[G] 10 × 83
[H] 10 × 50
[I] 10 × 68
[J] 24 × 10
[K] 92 × 10
[L] 10 × 95
[M] 10 × 81
[N] 58 × 10
[O] 39 × 10
[P] 10 × 33
[Q] 70 × 10
[R] 10 × 30
[S] 66 × 10
[T] 10 × 14

3. Give the value in cents for each set of dimes.

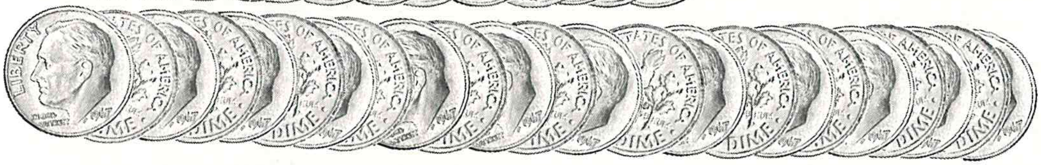
[A]



[B]



[C]



4. Give the value in cents for each coin collection.

[A] 5 dimes
[B] 10 dimes
[C] 20 dimes
[D] 15 dimes
[E] 27 dimes
[F] 40 dimes
[G] 52 dimes
[H] 91 dimes
[I] 56 dimes
[J] 48 dimes

5. Find the products.

[A] 27 × 10
[B] 10 × 38
[C] 43 × 10
[D] 11 × 10
[E] 10 × 34
[F] 65 × 10
[G] 91 × 10
[H] 10 × 10
[I] 10 × 82
[J] 73 × 10
[K] 10 × 14
[L] 10 × 80
[M] 19 × 10
[N] 76 × 10
[O] 10 × 50
[P] 8 × 100
[Q] 10 × 21
[R] 86 × 10
[S] 52 × 10
[T] 10 × 7
[U] 10 × 96
[V] 87 × 10
[W] 60 × 10
[X] 10 × 48
[Y] 28 × 10

★ 6. Find the products.

[A] (3 × 2) × 10
3 × (2 × 10)
3 × 20

[B] (3 × 4) × 10
3 × (4 × 10)
3 × 40

[C] (9 × 3) × 10
9 × (3 × 10)
9 × 30

[D] (5 × 8) × 10
5 × (8 × 10)
5 × 80

[E] (5 × 7) × 10
5 × (7 × 10)
5 × 70

[F] (7 × 4) × 10
7 × (4 × 10)
7 × 40

[G] (7 × 8) × 10
7 × (8 × 10)
7 × 80

[H] (6 × 4) × 10
6 × (4 × 10)
6 × 40

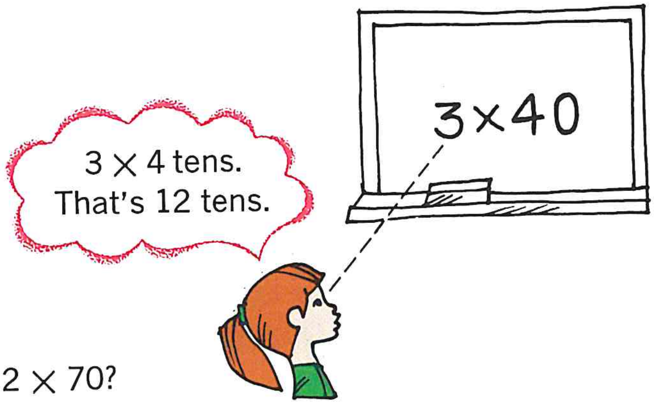
Think

Now I am a number
You rarely can beat.
When I am a factor
I surely am neat.
Use the other factor.
Make zero the tail.
You'll see the product.
You really can't fail.

WHO AM I?

Factors 10, 20, 30 . . .

DISCUSSION EXERCISES


3×40
3 × 4 tens.
That's 12 tens.

Fran

1. Explain how Fran is thinking about the product 3 × 40.

2. Write the numeral for 12 tens.

3. Solve: 3 × 40 = n

4. How would Fran think about 2 × 70?

5. Solve: 2 × 70 = n

Give the missing number in exercises 6, 7, and 8.

4 × 20

6. [A] 4 × ▨ tens
[B] ▨ tens in all
[C] 4 × 20 = n

5 × 30

7. [A] 5 × ▨ tens
[B] ▨ tens in all
[C] 5 × 30 = n

6 × 40

8. [A] 6 × ▨ tens
[B] ▨ tens in all
[C] 6 × 40 = n

EXERCISES

1. Solve the equations.

[A] (4 × 2) × 10 = n
4 × (2 × 10) = n
4 × 20 = n

[B] (5 × 3) × 10 = n
5 × (3 × 10) = n
5 × 30 = n

[C] (6 × 4) × 10 = n
6 × (4 × 10) = n
6 × 40 = n

[D] (7 × 3) × 10 = n
7 × (3 × 10) = n
7 × 30 = n

[E] (4 × 8) × 10 = n
4 × (8 × 10) = n
4 × 80 = n

[F] (5 × 6) × 10 = n
5 × (6 × 10) = n
5 × 60 = n

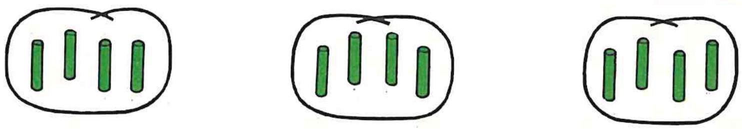
2. Find the products.

[A] 4 × 60
[B] 3 × 50
[C] 20 × 7
[D] 5 × 50
[E] 30 × 6
[F] 4 × 30
[G] 70 × 6
[H] 5 × 80
[I] 90 × 3
[J] 70 × 2
[K] 60 × 5
[L] 9 × 20
[M] 40 × 4
[N] 7 × 80
[O] 6 × 50
[P] 4 × 80
[Q] 60 × 8
[R] 7 × 60
[S] 5 × 20
[T] 70 × 3
[U] 2 × 50
[V] 4 × 90
[W] 90 × 7
[X] 9 × 90
[Y] 2 × 60

Related products

Find each product.

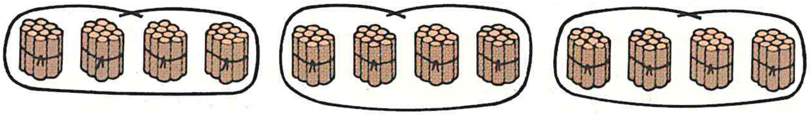
A



3 sets of 4

$3 \times 4 = \boxed{n}$

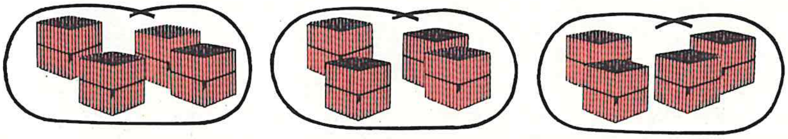
B



3 sets of 40

$3 \times 40 = \boxed{n}$

C



3 sets of 400

$3 \times 400 = \boxed{n}$

EXERCISES

1. Find the products.

[A] 4 × 6
4 × 60
4 × 600

[B] 6 × 3
6 × 30
6 × 300

[C] 3 × 7
3 × 70
3 × 700

[D] 5 × 7
5 × 70
5 × 700

[E] 3 × 9
3 × 90
3 × 900

[F] 6 × 6
6 × 60
6 × 600

[G] 7 × 4
7 × 40
7 × 400

[H] 5 × 8
5 × 80
5 × 800

2. Find the products.

[A] 3 × 70
[B] 3 × 700
[C] 4 × 30
[D] 4 × 300
[E] 2 × 80
[F] 2 × 800
[G] 6 × 10
[H] 6 × 100
[I] 7 × 20
[J] 7 × 200
[K] 8 × 40
[L] 3 × 70
[M] 2 × 90
[N] 9 × 30
[O] 5 × 50
[P] 8 × 400
[Q] 3 × 700
[R] 2 × 900
[S] 9 × 300
[T] 5 × 500
[U] 4 × 800

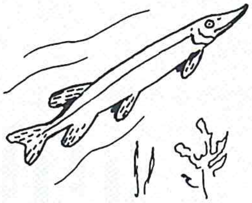
Think

If it's products you are after,
I will lend a helping hand.
Just use me over and over,
On the answer you will land.

WHO AM I?

About how fast they can go

Pike

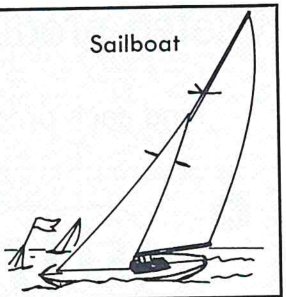


10 miles per hour

Runner

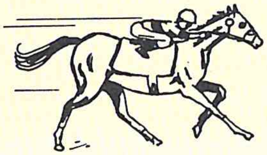
20 miles per hour

Sailboat



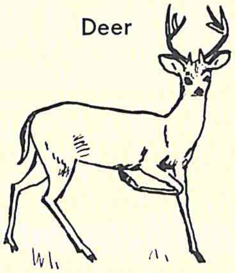
30 miles per hour

Race horse



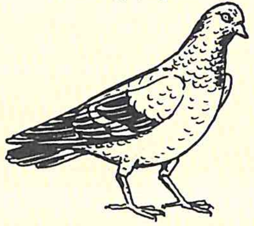
40 miles per hour

Deer



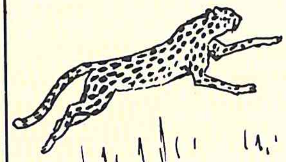
50 miles per hour

Homing pigeon



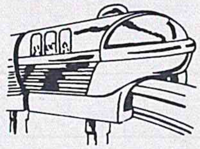
60 miles per hour

Cheetah



70 miles per hour

Monorail train

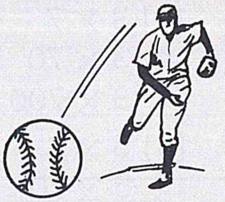


80 miles per hour

Vulture

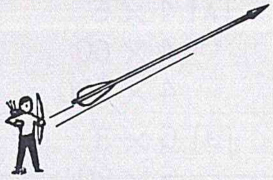
90 miles per hour

Pitched baseball



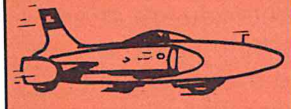
100 miles per hour

Arrow



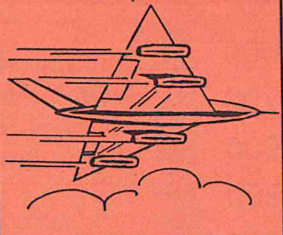
200 miles per hour

Racing car



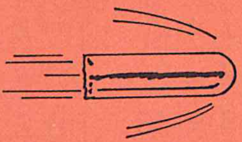
400 miles per hour

Jet plane



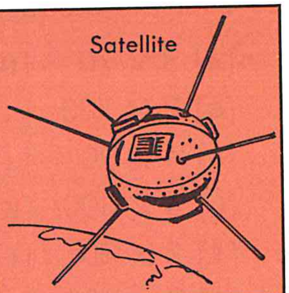
600 miles per hour

Bullet



1400 miles per hour

Satellite



17,000 miles per hour

EXERCISES

1. A helicopter can fly about 3 times as fast as a homing pigeon. How fast can the helicopter fly?

2. Racing bikes can be made to go 2 times as fast as a deer. How fast can racing bikes go?

3. A jet speed boat goes 9 times as fast as a sailboat. How fast does a jet speed boat go?

4. What object can go 10 times as fast as a pike can swim?

5. A racing car runs for 9 hours. A jet flies for 7 hours. Which goes farther? How much farther?

6. A propeller plane can fly 5 times as fast as a vulture. How fast can a propeller plane fly?

7. A golden eagle can fly about 4 times as fast as a sailboat can sail. How fast can the golden eagle fly?

8. A bullet goes how many times as fast as an arrow?

9. If a cheetah could run 6 times as fast as usual, could it catch a racing car? How fast would the cheetah be running?

10. A man flies in a jet from Coast City to East City.
It takes him 5 hours for the trip.
About how far is it from Coast City to East City?

11. A boy rode for 7 hours on a monorail train. How far did he ride?

★ 12. A homing pigeon was taken 300 miles from home. About how many hours would it take the pigeon to fly back home?

★ 13. A racing car can go how many times as fast as a deer?

★ 14. How much faster than its usual rate would a vulture have to fly to pass a jet plane?

★ 15. A satellite circles the earth for 5 hours. How far does it travel?

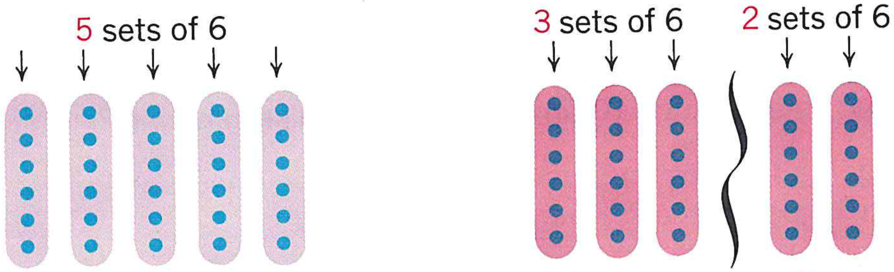
★ 16. A turtle would have to go 10 times faster than usual to go 1 mile in an hour. How many hours would it take a turtle to go 10 miles?

The multiplication–addition principle again

DISCUSSION EXERCISES

1. This exercise will help you understand more about the multiplication-addition principle. Solve the equations and give the missing numbers.

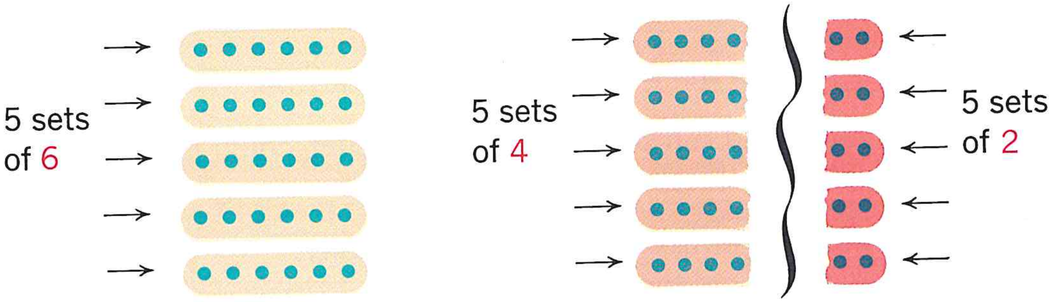
[A]



$5 \times 6 = \boxed{n} \longrightarrow (3 \times 6) + (2 \times 6) = \boxed{n}$

For 5 **sixes,** we can think 3 **sixes** and ▨ **sixes.**

[B]



$5 \times 6 = \boxed{n} \longrightarrow (5 \times 4) + (5 \times 2) = \boxed{n}$

For 5 sixes, we can think 5 fours and 5 _?_.

2. In exercise 1A, we "broke apart" the first factor. Which factor, first or second, did we "break apart" in exercise 1B?

3. Give the missing numbers.

[A] 4 fives and 4 _?_

4×7

[B] 7 threes and 7 _?_

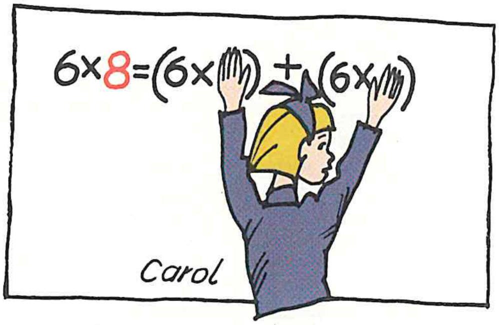
7×5

4. Carol's hands are covering two numbers.

[A] Could the numbers be 6 and 2?

[B] Could the numbers be 3 and 2?

[C] Write 5 different equations to show what pairs of numbers Carol might be hiding.



EXERCISES

1. Find the missing numbers.

[A] $5 \times 7 = (5 \times 6) + (5 \times \boxed{n})$

[B] $5 \times 7 = (5 \times 5) + (5 \times \boxed{n})$

[C] $5 \times 7 = (5 \times 4) + (5 \times \boxed{n})$

[D] $5 \times 7 = (5 \times \boxed{n}) + (5 \times 3)$

[E] $4 \times 6 = (4 \times 5) + (4 \times \boxed{n})$

[F] $4 \times 6 = (4 \times 4) + (4 \times \boxed{n})$

[G] $4 \times 6 = (4 \times \boxed{n}) + (4 \times 3)$

[H] $8 \times 5 = (8 \times 4) + (8 \times \boxed{n})$

[I] $8 \times 5 = (8 \times \boxed{n}) + (8 \times 3)$

[J] $8 \times 5 = (8 \times \boxed{n}) + (8 \times 2)$

[K] $7 \times 8 = (7 \times 7) + (7 \times \boxed{n})$

[L] $7 \times 8 = (7 \times 6) + (7 \times \boxed{n})$

[M] $7 \times 8 = (7 \times 5) + (7 \times \boxed{n})$

[N] $7 \times 8 = (7 \times \boxed{n}) + (7 \times 4)$

[O] $3 \times 9 = (3 \times 8) + (3 \times \boxed{n})$

[P] $3 \times 9 = (3 \times 7) + (3 \times \boxed{n})$

[Q] $3 \times 9 = (3 \times 6) + (3 \times \boxed{n})$

[R] $3 \times 9 = (3 \times 5) + (3 \times \boxed{n})$

[S] $4 \times 2 = (4 \times 1) + (4 \times \boxed{n})$

[T] $5 \times 2 = (5 \times \boxed{n}) + (5 \times 1)$

2. Find the missing numbers.

[A] $4 \times 12 = (4 \times 10) + (4 \times \boxed{n})$

[B] $3 \times 15 = (3 \times 10) + (3 \times \boxed{n})$

[C] $2 \times 26 = (2 \times 20) + (2 \times \boxed{n})$

[D] $5 \times 38 = (5 \times 30) + (5 \times \boxed{n})$

[E] $7 \times 14 = (7 \times 10) + (7 \times \boxed{n})$

[F] $8 \times 24 = (8 \times 20) + (8 \times \boxed{n})$

[G] $6 \times 57 = (6 \times 50) + (6 \times \boxed{n})$

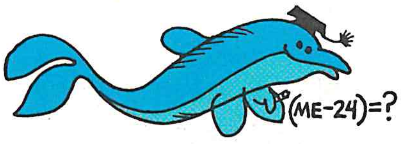
[H] $9 \times 78 = (9 \times \boxed{n}) + (9 \times 8)$

[I] $4 \times 63 = (4 \times \boxed{n}) + (4 \times 3)$

[J] $7 \times 21 = (7 \times \boxed{n}) + (7 \times 1)$

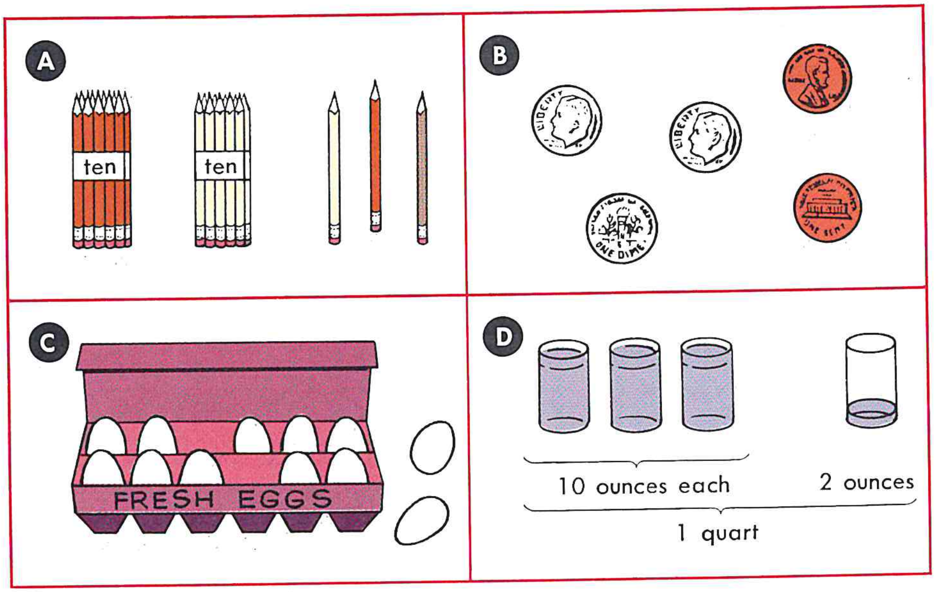
Think

Subtract 24 from me,
Or take me from 42.
Your answer is the same,
Whichever one you do.



WHO AM I?

Multiplication–addition problems



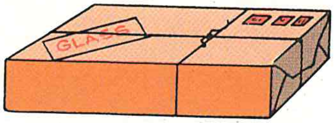
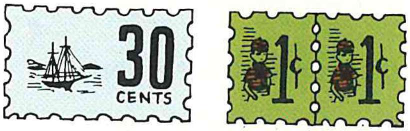
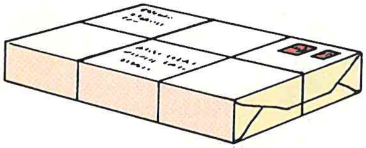
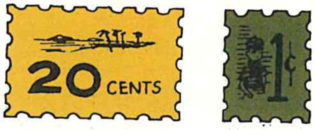
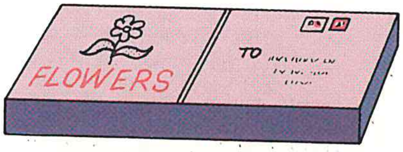
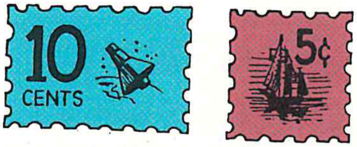
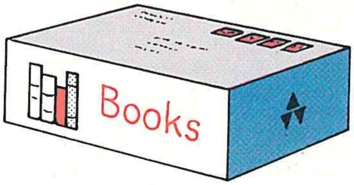
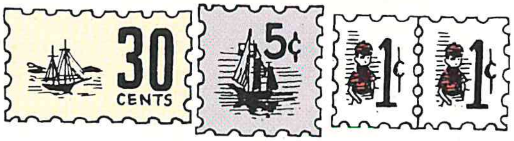
1. [A] How many pencils do you see in box A?
   [B] If Jerry has 2 times as many pencils, how many does he have?
   [C] Suppose a box has 3 times as many pencils as box A. How many pencils are there in the box?

2. [A] What is the value in cents of the money pictured in box B?
   [B] If Tom has twice that much money, how much does he have?
   [C] Suppose a toy cost 3 times as much as the amount pictured in box B. How much does the toy cost?

3. [A] One dozen is 10 and 2. (See box C.) How many are in a dozen?
   [B] How many are in 3 dozen?
   [C] How many are in 4 dozen?
   ★ [D] How many are in 5 dozen?

4. [A] Look at box D and tell how many ounces are in a quart.
   [B] How many ounces are in 2 quarts?
   [C] How many ounces are in 3 quarts?
   ★ [D] How many ounces are in 5 quarts?

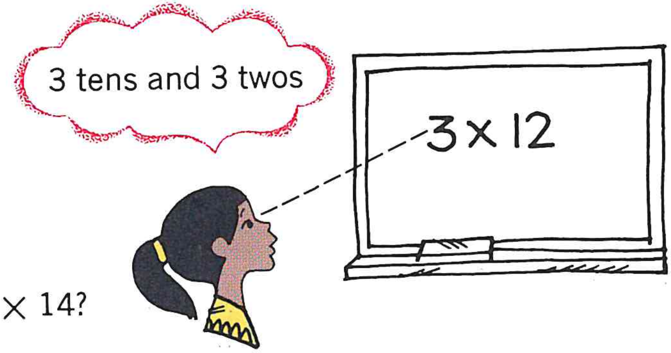
Mailing packages

Package	Stamps needed
Ⓐ 	
Ⓑ 	
Ⓒ 	
Ⓓ 	

1. [A] How much did it cost to mail package A?
   [B] How much would it cost to mail 3 packages like this one?
2. [A] How much did it cost to mail package B?
   [B] How much would it cost to mail 4 packages like this one?
3. [A] How much did it cost to mail package C?
   [B] How much would it cost to mail 2 packages like this?
   [C] How much would it cost for 3 such packages?
4. [A] How much did it cost to mail package D?
   [B] How much would it cost to mail 2 packages like this?
   [C] How much would it cost to mail 5 such packages?

Using the multiplication–addition principle

DISCUSSION EXERCISES



1. Explain how Sue is thinking about the product 3 × 12.
2. Write the numeral for 3 tens.
3. Write the numeral for 3 twos.
4. Give the product for 3 × 12.
5. How would Sue think about 2 × 14?
6. Find the product for 2 × 14.

EXERCISES

1. Give the missing numbers.

[A] 4 tens and 4 _?_ 4×12

[B] 2 tens and 2 _?_ 2×13

[C] 3 tens and 3 _?_ 3×11

[D] $(4 \times 10) + (4 \times \boxed{n})$ 4×12

[E] $(2 \times 10) + (2 \times \boxed{n})$ 2×13

[F] $(3 \times 10) + (3 \times \boxed{n})$ 3×11

2. Solve the equations.

[A] $4 \times 12 = (4 \times 10) + (4 \times \boxed{n})$
[B] $2 \times 13 = (2 \times 10) + (2 \times \boxed{n})$
[C] $3 \times 11 = (3 \times 10) + (3 \times \boxed{n})$
[D] $5 \times 11 = (5 \times 10) + (5 \times \boxed{n})$
[E] $2 \times 34 = (2 \times 30) + (2 \times \boxed{n})$
[F] $2 \times 23 = (2 \times 20) + (2 \times \boxed{n})$

[G] $3 \times 23 = (3 \times \boxed{n}) + (3 \times 3)$
[H] $4 \times 13 = (4 \times \boxed{n}) + (4 \times 3)$
[I] $5 \times 14 = (5 \times \boxed{n}) + (5 \times 4)$
[J] $6 \times 13 = (6 \times \boxed{n}) + (6 \times 3)$
[K] $4 \times 24 = (4 \times \boxed{n}) + (4 \times 4)$
[L] $3 \times 27 = (3 \times \boxed{n}) + (3 \times 7)$

EXERCISES

Find the products and sums.

1. [A] $3 \times 10 = \boxed{n}$
   [B] $3 \times 2 = \boxed{n}$
   [C] $(3 \times 10) + (3 \times 2) = \boxed{n}$
   [D] $3 \times 12 = \boxed{n}$

2. [A] $4 \times 10 = \boxed{n}$
   [B] $4 \times 2 = \boxed{n}$
   [C] $(4 \times 10) + (4 \times 2) = \boxed{n}$
   [D] $4 \times 12 = \boxed{n}$

3. [A] $2 \times 10 = \boxed{n}$
   [B] $2 \times 3 = \boxed{n}$
   [C] $(2 \times 10) + (2 \times 3) = \boxed{n}$
   [D] $2 \times 13 = \boxed{n}$

4. [A] $2 \times 30 = \boxed{n}$
   [B] $2 \times 4 = \boxed{n}$
   [C] $(2 \times 30) + (2 \times 4) = \boxed{n}$
   [D] $2 \times 34 = \boxed{n}$

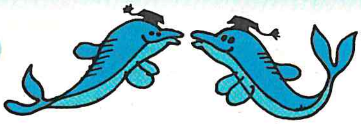
5. [A] $2 \times 20 = \boxed{n}$
   [B] $2 \times 3 = \boxed{n}$
   [C] $(2 \times 20) + (2 \times 3) = \boxed{n}$
   [D] $2 \times 23 = \boxed{n}$

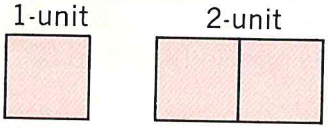
6. [A] $3 \times 20 = \boxed{n}$
   [B] $3 \times 3 = \boxed{n}$
   [C] $(3 \times 20) + (3 \times 3) = \boxed{n}$
   [D] $3 \times 23 = \boxed{n}$

7. [A] $6 \times 10 = \boxed{n}$
   [B] $6 \times 3 = \boxed{n}$
   [C] $(6 \times 10) + (6 \times 3) = \boxed{n}$
   [D] $6 \times 13 = \boxed{n}$

8. [A] $4 \times 20 = \boxed{n}$
   [B] $4 \times 4 = \boxed{n}$
   [C] $(4 \times 20) + (4 \times 4) = \boxed{n}$
   [D] $4 \times 24 = \boxed{n}$

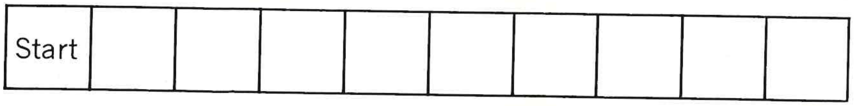
Think





Make 8 of these   Make 5 of these

This is a game for two. The object is to cover the 10-unit strip exactly with the 1-unit and 2-unit pieces. Start at the left and take turns placing either a 1-unit or a 2-unit side by side until the 10-unit is exactly covered. The last one to put down a strip wins the game.



Try this game using an 11-unit strip. Try it with a 12-unit strip.

2-digit factors

DISCUSSION EXERCISES

Study this equation for example 1.

$$\begin{array}{cccccc} 2\times 34 = & (2\times 30) & + & (2\times 4) & & \\ & \downarrow & & \downarrow & & \\ & 60 & + & 8 & = & 68 \end{array}$$

Example 1: 2 × 34

Step 1	Step 2	Step 3
$\begin{array}{r} 34 \\ \times 2 \\ \hline 8 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 2 \\ \hline 8 \\ \rightarrow 60 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 2 \\ \hline 8 \\ 60 \\ \hline 68 \end{array}$
2×4=8	2×30=60	8+60=68

1. Which part of the equation is like step 1 of example 1?
2. Which part is like step 2?
3. Which part is like step 3?

Study this equation for example 2.

$$\begin{array}{cccccc} 3\times 48 = & (3\times 40) & + & (3\times 8) & & \\ & \downarrow & & \downarrow & & \\ & 120 & + & 24 & = & 144 \end{array}$$

Example 2: 3 × 48

Step 1	Step 2	Step 3
$\begin{array}{r} 48 \\ \times 3 \\ \hline 24 \end{array}$	$\begin{array}{r} 48 \\ \times 3 \\ \hline 24 \\ \rightarrow 120 \\ \hline \end{array}$	$\begin{array}{r} 48 \\ \times 3 \\ \hline 24 \\ 120 \\ \hline 144 \end{array}$
3×8=24	3×40=120	24+120=144

4. Which part of the equation is like step 1 of example 2?
5. Which part is like step 2?
6. Which part is like step 3?

EXERCISES

1. Find the products.

[A] $\begin{array}{r} 15 \\ \times 3 \\ \hline \end{array}$	[B] $\begin{array}{r} 21 \\ \times 4 \\ \hline \end{array}$	[C] $\begin{array}{r} 16 \\ \times 2 \\ \hline \end{array}$	[D] $\begin{array}{r} 37 \\ \times 2 \\ \hline \end{array}$	[E] $\begin{array}{r} 25 \\ \times 3 \\ \hline \end{array}$	[F] $\begin{array}{r} 38 \\ \times 2 \\ \hline \end{array}$
[G] $\begin{array}{r} 63 \\ \times 2 \\ \hline \end{array}$	[H] $\begin{array}{r} 36 \\ \times 2 \\ \hline \end{array}$	[I] $\begin{array}{r} 57 \\ \times 2 \\ \hline \end{array}$	[J] $\begin{array}{r} 48 \\ \times 3 \\ \hline \end{array}$	[K] $\begin{array}{r} 67 \\ \times 4 \\ \hline \end{array}$	[L] $\begin{array}{r} 93 \\ \times 3 \\ \hline \end{array}$

2. Find the products.

[A] $\begin{array}{r} 14 \\ \times 5 \\ \hline \end{array}$ [B] $\begin{array}{r} 38 \\ \times 2 \\ \hline \end{array}$ [C] $\begin{array}{r} 24 \\ \times 3 \\ \hline \end{array}$ [D] $\begin{array}{r} 19 \\ \times 4 \\ \hline \end{array}$ [E] $\begin{array}{r} 47 \\ \times 4 \\ \hline \end{array}$ [F] $\begin{array}{r} 34 \\ \times 2 \\ \hline \end{array}$

[G] $\begin{array}{r} 67 \\ \times 3 \\ \hline \end{array}$ [H] $\begin{array}{r} 35 \\ \times 2 \\ \hline \end{array}$ [I] $\begin{array}{r} 36 \\ \times 5 \\ \hline \end{array}$ [J] $\begin{array}{r} 58 \\ \times 3 \\ \hline \end{array}$ [K] $\begin{array}{r} 75 \\ \times 4 \\ \hline \end{array}$ [L] $\begin{array}{r} 17 \\ \times 4 \\ \hline \end{array}$

[M] $\begin{array}{r} 18 \\ \times 3 \\ \hline \end{array}$ [N] $\begin{array}{r} 22 \\ \times 4 \\ \hline \end{array}$ [O] $\begin{array}{r} 94 \\ \times 3 \\ \hline \end{array}$ [P] $\begin{array}{r} 26 \\ \times 3 \\ \hline \end{array}$ [Q] $\begin{array}{r} 29 \\ \times 5 \\ \hline \end{array}$ [R] $\begin{array}{r} 18 \\ \times 2 \\ \hline \end{array}$

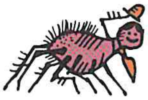
[S] $\begin{array}{r} 31 \\ \times 8 \\ \hline \end{array}$ [T] $\begin{array}{r} 73 \\ \times 4 \\ \hline \end{array}$ [U] $\begin{array}{r} 19 \\ \times 3 \\ \hline \end{array}$ [V] $\begin{array}{r} 42 \\ \times 7 \\ \hline \end{array}$ [W] $\begin{array}{r} 27 \\ \times 3 \\ \hline \end{array}$ [X] $\begin{array}{r} 32 \\ \times 8 \\ \hline \end{array}$

Short stories

1. 12 dogs, 4 legs each.
   How many legs in all?

2. 14 ants, 6 legs per ant.
   How many legs?

3. 12 spiders, 8 legs per spider.
   How many legs?



4. 13 octopuses, 8 arms each.
   How many arms?

5. 14 crayfish, 10 legs each.
   How many legs?

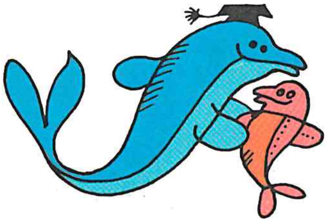
6. 36 crickets, 6 legs each.
   How many legs?

7. 42 fish, no legs per fish.
   How many legs in all?

8. 4 centipedes, 36 legs each.
   How many legs?

Think

Together, a doll and a dress cost $11. The doll cost $10 more than the dress. How much was the doll?



Short cut

DISCUSSION EXERCISES

1. Explain each step of the long method.

2. Explain how step 1 of the short cut is like step 1 of the long method.

3. Explain how step 2 of the short cut puts together step 2 and step 3 of the long method.

4. Explain each step in this exercise.

$$\begin{array}{r} {}^{2} \\ 18 \\ \times 3 \\ \hline 54 \end{array}$$

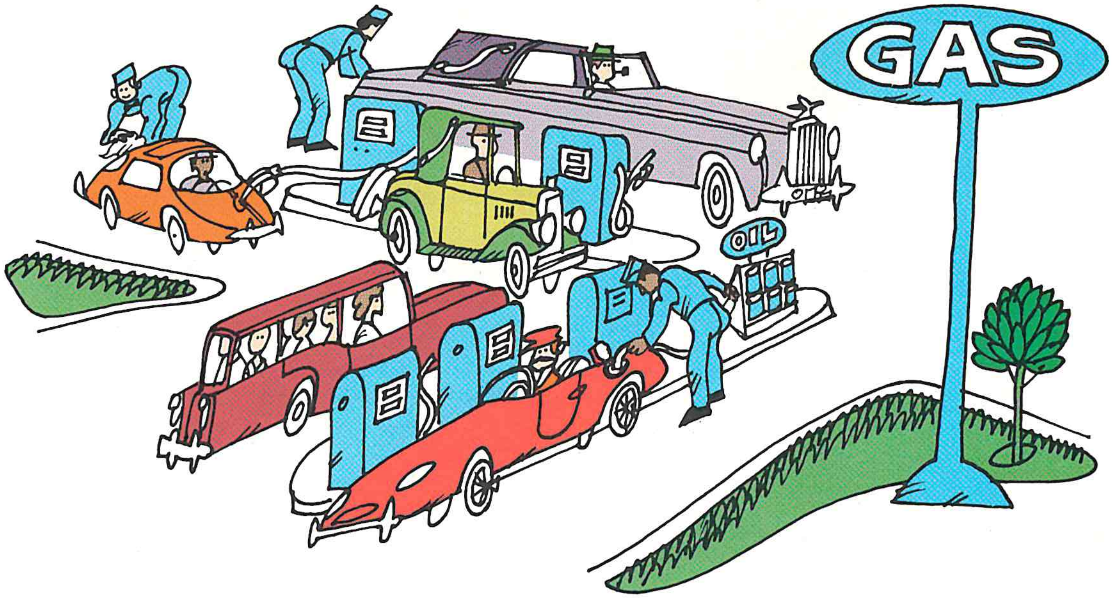
Long Method		
Step 1	Step 2	Step 3
$\begin{array}{r} 46 \\ \times 3 \\ \hline 18 \end{array}$	$\begin{array}{r} 46 \\ \times 3 \\ \hline 18 \\ 120 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ \times 3 \\ \hline 18 \\ 120 \\ \hline 138 \end{array}$
3×6=18	3×40=120	18+120=138

Short Cut	
Step 1	Step 2
$\begin{array}{r} {}^{1} \\ 46 \\ \times 3 \\ \hline 8 \end{array}$	$\begin{array}{r} {}^{1} \\ 46 \\ \times 3 \\ \hline 138 \end{array}$
3×6=18	3×40=120 120+10=130

EXERCISES

1. $\begin{array}{r} 24 \\ \times 4 \\ \hline \end{array}$
2. $\begin{array}{r} 15 \\ \times 3 \\ \hline \end{array}$
3. $\begin{array}{r} 38 \\ \times 2 \\ \hline \end{array}$
4. $\begin{array}{r} 24 \\ \times 6 \\ \hline \end{array}$
5. $\begin{array}{r} 19 \\ \times 3 \\ \hline \end{array}$
6. $\begin{array}{r} 47 \\ \times 3 \\ \hline \end{array}$
7. $\begin{array}{r} 39 \\ \times 2 \\ \hline \end{array}$
8. $\begin{array}{r} 21 \\ \times 4 \\ \hline \end{array}$
9. $\begin{array}{r} 30 \\ \times 2 \\ \hline \end{array}$
10. $\begin{array}{r} 63 \\ \times 4 \\ \hline \end{array}$
11. $\begin{array}{r} 37 \\ \times 2 \\ \hline \end{array}$
12. $\begin{array}{r} 37 \\ \times 3 \\ \hline \end{array}$
13. $\begin{array}{r} 26 \\ \times 3 \\ \hline \end{array}$
14. $\begin{array}{r} 54 \\ \times 5 \\ \hline \end{array}$
15. $\begin{array}{r} 67 \\ \times 5 \\ \hline \end{array}$
16. $\begin{array}{r} 75 \\ \times 6 \\ \hline \end{array}$
17. $\begin{array}{r} 54 \\ \times 4 \\ \hline \end{array}$
18. $\begin{array}{r} 68 \\ \times 4 \\ \hline \end{array}$

Miles per gallon



1. Mr. White can drive his car about 17 miles on one gallon of gas. How far can he drive on 5 gallons of gas?

2. Mr. Brown's car goes only 14 miles on each gallon of gas. How far can he drive on 7 gallons of gas?

3. Mr. Gray has a small car and can drive 24 miles on a gallon of gas. How far can he drive on 4 gallons of gas?

4. Mr. Jones can drive 33 miles on 2 gallons of gas. Mr. Smith can drive 16 miles on 1 gallon of gas.
   [A] Who can drive farther on 4 gallons of gas?
   [B] Who can drive farther on 2 gallons of gas?
   [C] Who can drive farther on 1 gallon of gas?
   [D] Who can drive farther on 1 quart of gas?

5. Mr. Black can drive his car 20 miles on a gallon of gas.
   [A] How far can he drive on $2\frac{1}{2}$ gallons of gas?
   [B] How far can he drive on 1 gallon and 1 quart of gas?
   [C] How much gas would he use in driving 70 miles?

Practice finding products

Find the products.

1. 37 ×4
2. 56 ×2
3. 95 ×3
4. 43 ×4
5. 82 ×5
6. 96 ×4
7. 54 ×3
8. 38 ×6
9. 69 ×5
10. 57 ×2
11. 70 ×3
12. 58 ×2
13. 49 ×5
14. 68 ×4
15. 65 ×4
16. 85 ×4
17. 66 ×2
18. 77 ×3
19. 72 ×6
20. 48 ×5
21. 75 ×4
22. 57 ×6
23. 79 ×2
24. 59 ×3
25. 67 ×4
26. 58 ×6
27. 88 ×4
28. 64 ×3
29. 98 ×3
30. 63 ×5
31. 76 ×5
32. 75 ×7
33. 74 ×9
34. 59 ×8
35. 47 ×8
36. 78 ×2
37. 99 ×6
38. 87 ×6
39. 97 ×5
40. 86 ×9
41. 94 ×4
42. 89 ×7

★ Find the products.

1. 386 ×2
2. 386 ×3
3. 386 ×4
4. 386 ×8
5. 578 ×7
6. 874 ×5
7. 6384 ×2
8. 3251 ×4
9. 6524 ×3

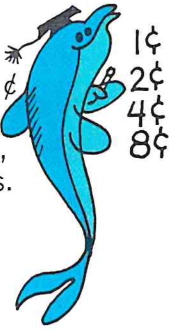
Think

Jim had 1 minute to decide which of these allowances he wanted.

▶$1.00 per week

or

▶Each week he gets 1¢ the first day, 2¢ the second, 4¢ the third, and so on for 7 days.



Which would you take?

Give yourself 1 minute to decide. Then figure it out.

Time

1. There are 60 seconds in 1 minute. How many seconds are in 5 minutes?

2. There are 60 minutes in 1 hour. How many minutes are in 9 hours?

3. There are 24 hours in 1 day, and 7 days in a week. How many hours are in a week?

4. There are 12 months in 1 year. How many months are in 8 years?

5. There are about 52 weeks in 1 year. About how many weeks are in 6 years?

6. In each year, there are 7 months that have 31 days each. How many days in all are in these 7 months?

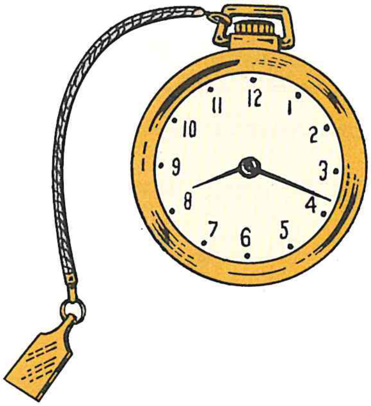
7. In each year, there are 4 months that have 30 days each. How many days in all are in these 4 months?

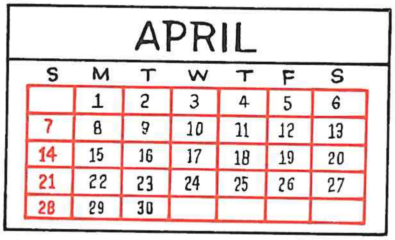
★ 8. How many days are in a year when February has 28 days? (Use your answers to exercises 6 and 7.)

★ 9. How many days are in a year when February has 29 days?

★ 10. How many seconds are in one hour?

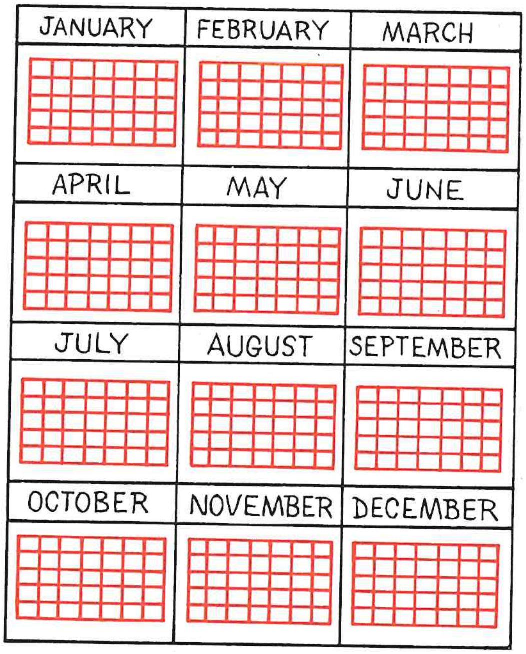
★ 11. How many seconds are in one day?

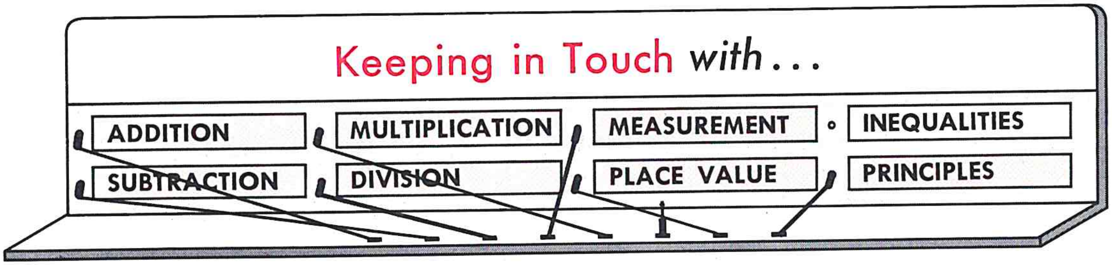




APRIL

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				



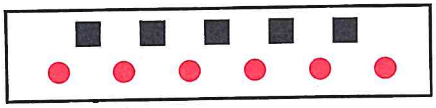


1. Find the missing numbers.

[A] $67 = 60 + \boxed{n}$ [C] $235 = 200 + \boxed{n} + 5$ [E] $348 = 300 + 40 + \boxed{n}$

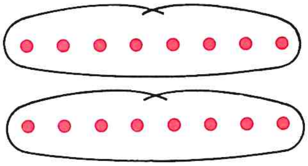
[B] $58 = \boxed{n} + 8$ [D] $762 = \boxed{n} + 60 + 2$ [F] $658 + 10 = \boxed{n}$

2. Write 2 addition and 2 subtraction equations for this set.



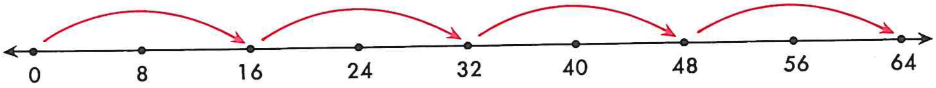
3. Write a multiplication equation for each exercise.

[A]



[B] $4 + 4 + 4 + 4 + 4 = 20$

[C]



4. Find the sums, differences, and products.

[A] $\begin{array}{r} 63 \\ +18 \\ \hline \end{array}$ [B] $\begin{array}{r} 95 \\ +7 \\ \hline \end{array}$ [C] $\begin{array}{r} 68 \\ +25 \\ \hline \end{array}$ [D] $\begin{array}{r} 83 \\ +72 \\ \hline \end{array}$ [E] $\begin{array}{r} 69 \\ +54 \\ \hline \end{array}$ [F] $\begin{array}{r} 93 \\ +67 \\ \hline \end{array}$

[G] $\begin{array}{r} 64 \\ -27 \\ \hline \end{array}$ [H] $\begin{array}{r} 75 \\ -46 \\ \hline \end{array}$ [I] $\begin{array}{r} 36 \\ -17 \\ \hline \end{array}$ [J] $\begin{array}{r} 127 \\ -54 \\ \hline \end{array}$ [K] $\begin{array}{r} 146 \\ -67 \\ \hline \end{array}$ [L] $\begin{array}{r} 152 \\ -74 \\ \hline \end{array}$

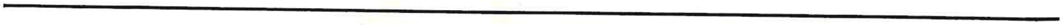
[M] $\begin{array}{r} 45 \\ \times 3 \\ \hline \end{array}$ [N] $\begin{array}{r} 67 \\ \times 2 \\ \hline \end{array}$ [O] $\begin{array}{r} 58 \\ \times 4 \\ \hline \end{array}$ [P] $\begin{array}{r} 83 \\ \times 3 \\ \hline \end{array}$ [Q] $\begin{array}{r} 58 \\ \times 6 \\ \hline \end{array}$ [R] $\begin{array}{r} 71 \\ \times 7 \\ \hline \end{array}$

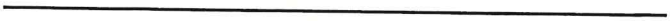
5. Write the numeral for each.

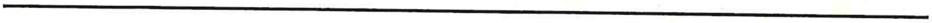
[A] Six thousand three hundred fifty-two

[B] Seventy-five thousand, nine hundred eighty-four

6. Measure each segment to the nearest centimeter.

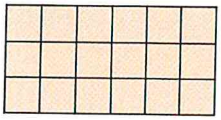
[A] 

[B] 

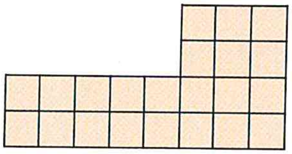
[C] 

7. Find the area of each region.

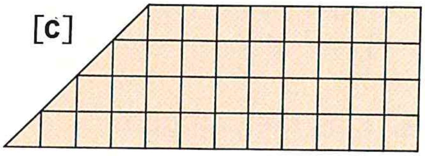
[A]



[B]

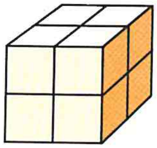


[C]

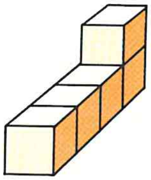


8. Find the volume of each region.

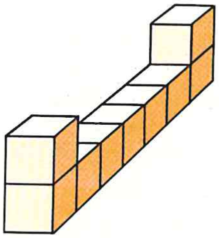
[A]



[B]



[C]



9. Think carefully to decide how to find the answer.

[A] How much for 5 apples?

[B] How much in all for 1 pound of grapes and 1 pound of bananas?

[C] 3 pears cost how much more than 4 lemons?

[D] How much does 1 lemon cost?

[E] How much is 1 dozen oranges?

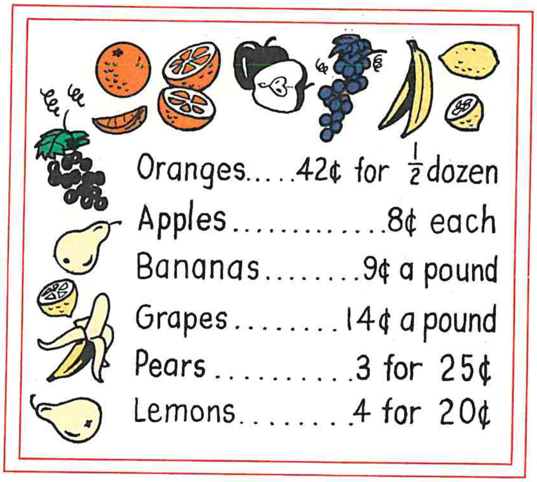
[F] How much is 1 orange?

[G] How much in all for 3 pears, 1 pound of grapes, and $\frac{1}{2}$ dozen oranges?

★ [H] Which costs more, 1 apple or 1 pear?

★ [I] 3 pounds of grapes cost as much as how many oranges?

★ [J] How much in all for $\frac{1}{2}$ pound of grapes, 4 oranges, and $\frac{1}{2}$ dozen lemons?



Oranges	42¢ for $\frac{1}{2}$ dozen
Apples	8¢ each
Bananas	9¢ a pound
Grapes	14¢ a pound
Pears	3 for 25¢
Lemons	4 for 20¢

Finding products

1. Find the products.

[A] 3 × 6
[B] 7 × 4
[C] 3 × 9
[D] 5 × 8
[E] 9 × 8
[F] 7 × 7
[G] 3 × 7
[H] 8 × 3
[I] 4 × 9
[J] 6 × 8
[K] 9 × 9
[L] 8 × 7
[M] 6 × 4
[N] 4 × 8
[O] 9 × 5
[P] 5 × 7
[Q] 7 × 9
[R] 6 × 6
[S] 5 × 6
[T] 5 × 5
[U] 9 × 6
[V] 6 × 7
[W] 5 × 4
[X] 8 × 8

2. Find the products.

[A] 6 × 10
[B] 20 × 3
[C] 10 × 9
[D] 40 × 4
[E] 15 × 10
[F] 5 × 30
[G] 6 × 50
[H] 10 × 34
[I] 80 × 10
[J] 7 × 20
[K] 10 × 68
[L] 7 × 40
[M] 9 × 50
[N] 9 × 90
[O] 10 × 84
[P] 7 × 30
[Q] 80 × 6
[R] 5 × 90
[S] 70 × 4
[T] 3 × 90
[U] 2 × 60
[V] 70 × 10
[W] 85 × 10
[X] 60 × 7

3. Find the products.

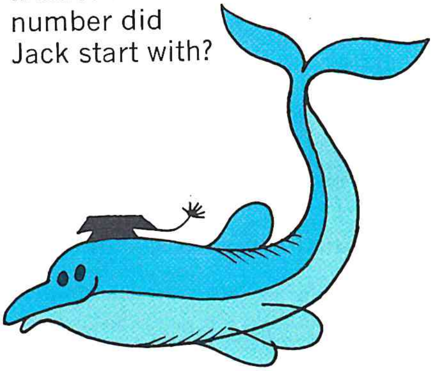
[A] $\begin{array}{r}32\\ \times 3\\ \hline\end{array}$
[B] $\begin{array}{r}43\\ \times 2\\ \hline\end{array}$
[C] $\begin{array}{r}44\\ \times 2\\ \hline\end{array}$
[D] $\begin{array}{r}17\\ \times 2\\ \hline\end{array}$
[E] $\begin{array}{r}28\\ \times 3\\ \hline\end{array}$
[F] $\begin{array}{r}19\\ \times 4\\ \hline\end{array}$

4. Find the products.

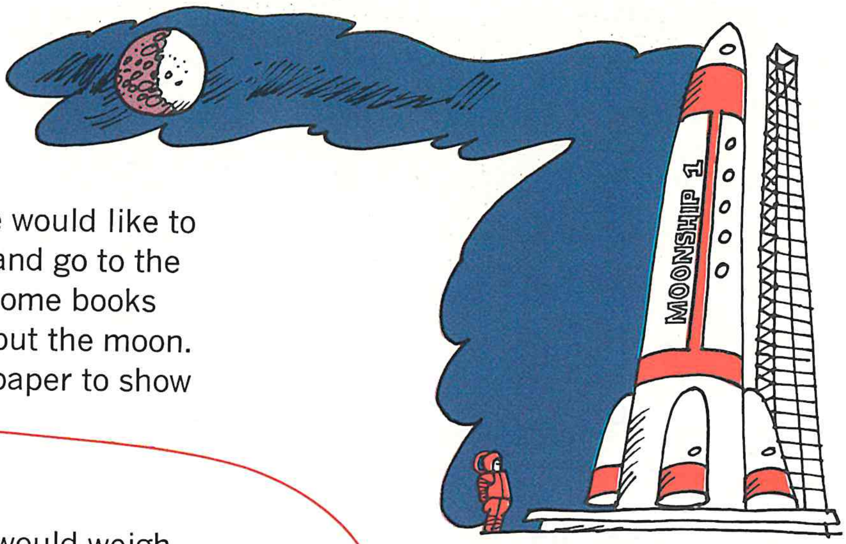
[A] $\begin{array}{r}47\\ \times 4\\ \hline\end{array}$
[B] $\begin{array}{r}56\\ \times 5\\ \hline\end{array}$
[C] $\begin{array}{r}87\\ \times 2\\ \hline\end{array}$
[D] $\begin{array}{r}27\\ \times 3\\ \hline\end{array}$
[E] $\begin{array}{r}56\\ \times 4\\ \hline\end{array}$
[F] $\begin{array}{r}65\\ \times 6\\ \hline\end{array}$
[G] $\begin{array}{r}73\\ \times 6\\ \hline\end{array}$
[H] $\begin{array}{r}65\\ \times 5\\ \hline\end{array}$
[I] $\begin{array}{r}76\\ \times 3\\ \hline\end{array}$
[J] $\begin{array}{r}74\\ \times 8\\ \hline\end{array}$
[K] $\begin{array}{r}67\\ \times 7\\ \hline\end{array}$
[L] $\begin{array}{r}89\\ \times 4\\ \hline\end{array}$

Think

Jack started with a number and multiplied it by 7. Then he added 75, subtracted 75 and divided by 7. Jack's answer was 19. What number did Jack start with?



A moon trip



Peter thinks he would like to be an astronaut and go to the moon. He read some books to learn more about the moon. Peter wrote this paper to show his teacher.

1. Peter figured he would weigh only 12 pounds on the moon. How much does Peter weigh on earth?

2. Peter's father would weigh 27 pounds on the moon. How much does he weigh on earth?

3. About how long does it take the moon to go around the earth 4 times?

4. Suppose you could fly straight to the moon and back. How far would you travel?

5. Peter drinks 4 cups of water each day.
   [A] How much water would he have to take for a 36-day moon trip?
   [B] How many quarts would this be?
   [C] How many gallons?

Moon Facts

1. The moon is much smaller than the earth.
2. People weigh 6 times as much on earth as they would on the moon.
3. The moon goes around the earth once in about 28 days.
4. The moon is about 240,000 miles from earth.
5. Scientists believe there is no air or water on the moon.

Peter L.

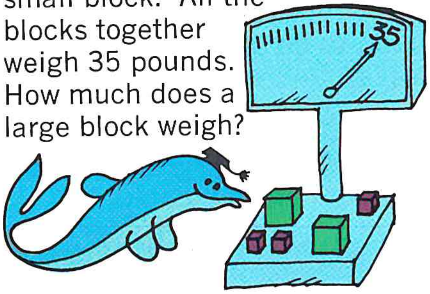
Practice multiplying

Find the products.

1. 54 ×2
2. 81 ×3
3. 55 ×5
4. 75 ×3
5. 58 ×4
6. 69 ×5
7. 91 ×3
8. 82 ×5
9. 67 ×6
10. 88 ×7
11. 87 ×4
12. 68 ×4
13. 74 ×4
14. 90 ×3
15. 73 ×6
16. 56 ×3
17. 80 ×6
18. 86 ×2
19. 66 ×4
20. 57 ×5
21. 51 ×3
22. 63 ×4
23. 76 ×3
24. 49 ×2
25. 78 ×5
26. 83 ×6
27. 97 ×3
28. 64 ×5
29. 52 ×5
30. 65 ×5
31. 79 ×2
32. 53 ×3
33. 98 ×4
34. 99 ×4
35. 41 ×7
36. 39 ×3
37. 62 ×6
38. 94 ×7
39. 77 ×5
40. 47 ×8
41. 43 ×4
42. 61 ×9

Think

The large blocks weigh the same and the small blocks weigh the same. Each large block weighs twice as much as a small block. All the blocks together weigh 35 pounds. How much does a large block weigh?



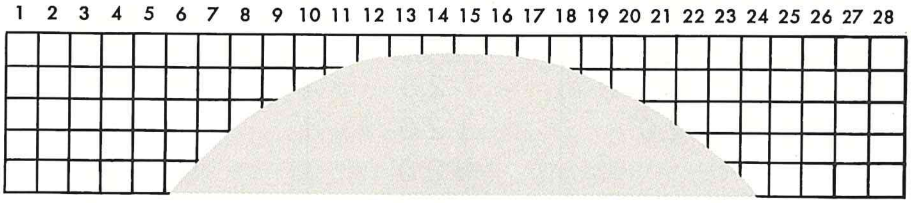
★ Find the products.

1. 367 ×3
2. 285 ×6
3. 349 ×5
4. 619 ×7
5. 539 ×7
6. 6434 ×9
7. 3267 ×8
8. 43,695 ×7

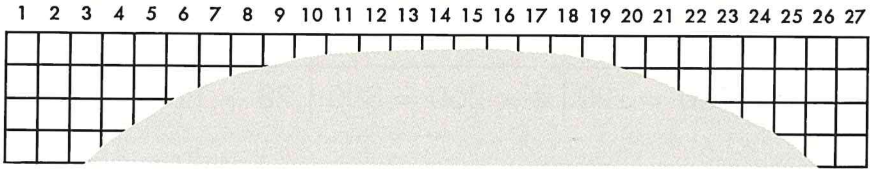
How many . . .

1. Give the number of squares, including the covered ones, for each strip of paper.

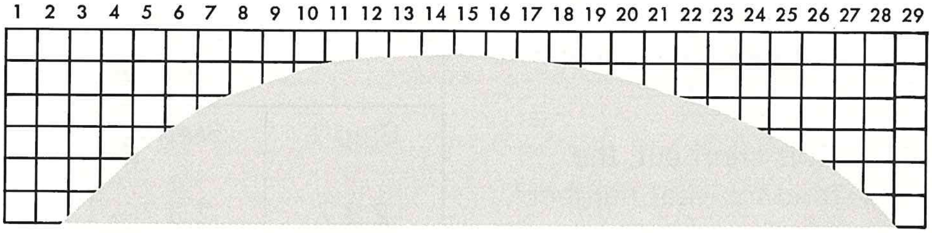
[A]



[B]

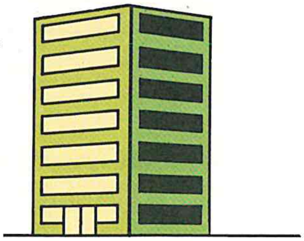


[C]

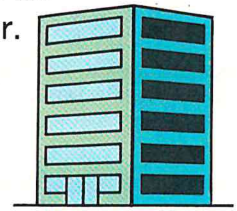


2. How many rooms are in each building?

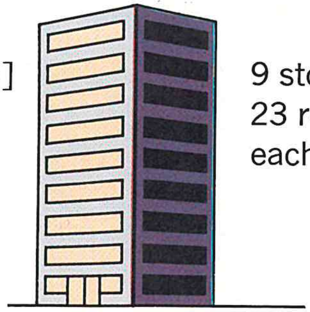
[A] 7 stories high.
25 rooms on
each floor.



[B] 6 stories high.
14 rooms on
each floor.

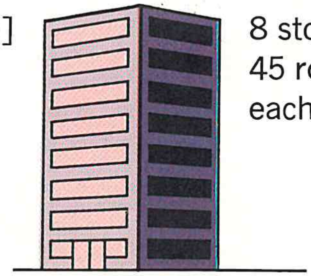


[C]



9 stories high.
23 rooms on
each floor.

[D]



8 stories high.
45 rooms on
each floor.

3-digit factors

Step 1	Step 2	Step 3	Step 4
237 × 4 28	237 × 4 28 120	237 × 4 28 120 800	237 × 4 28 120 800 948
4 × 7 = 28	4 × 30 = 120	4 × 200 = 800	28 + 120 + 800 = 948

DISCUSSION EXERCISES

1. Explain each step in the example above.
2. In step 1 of this short cut, the red digits stand for what number?
3. In step 2, the red digits 1 and 4 stand for what number?
4. Explain step 3 of the short cut.

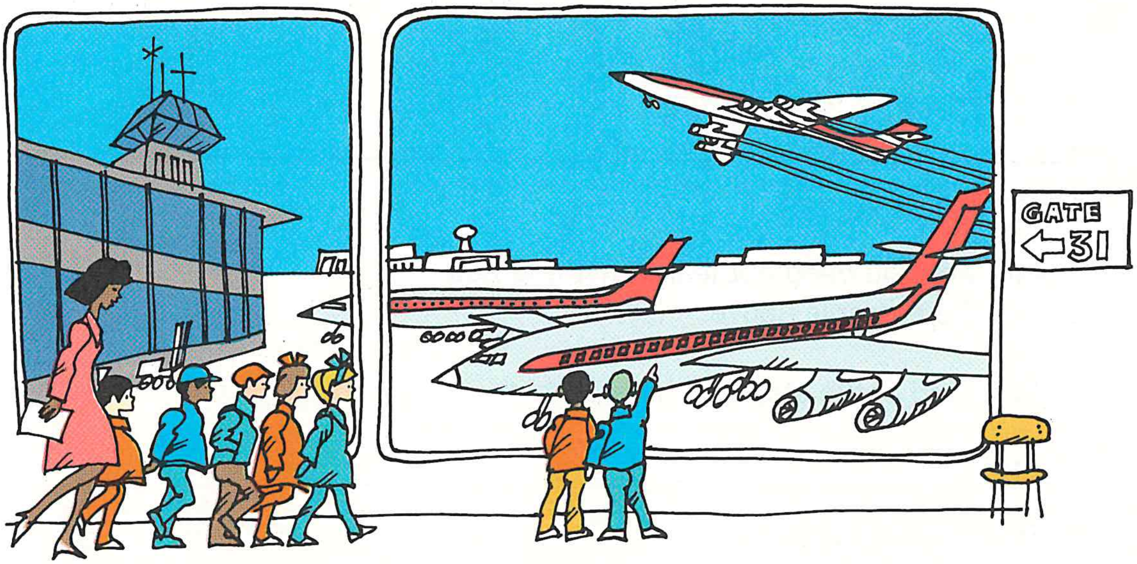
Short cut		
Step 1	Step 2	Step 3
2 237 × 4 8	1 2 237 × 4 48	1 2 237 × 4 948

EXERCISES

Find the products.

1. 289 ×3
2. 357 ×4
3. 621 ×5
4. 324 ×2
5. 607 ×3
6. 528 ×4
7. 982 ×2
8. 671 ×3
9. 743 ×6
10. 862 ×5
11. 211 ×9
12. 764 ×3
13. 925 ×4
14. 278 ×6
15. 179 ×5
16. 826 ×6
17. 534 ×7
18. 921 ×8
19. 807 ×9
20. 680 ×6

At the airport



1. Miss White took her third-grade class to visit the airport. While they were there, they saw 3 jet planes take off for Europe. Each plane carried 97 people. How many people in all left on the 3 planes?

2. Each large jet airliner has 4 engines. If each engine gives about 16,000 pounds of thrust (push) during takeoff, what is the total thrust during takeoff?

3. During most of the trip each engine gives about 6000 pounds of thrust. What is the total thrust then?

4. Suppose a large jet plane flies at the rate of 583 miles each hour. How far would it fly in 6 hours?

5. A pilot told the children that in a few years jet airliners would fly 3 times as fast as they do now. If they fly about 575 miles an hour now, about how fast will they fly in a few years?

Factors with 4 or more digits

Step 1	Step 2	Step 3	Step 4
$\begin{array}{ccccc} & & & 3 & \\ & 3 & 6 & 4 & 7 \\ & & & \times & 5 \\ \hline & & & & 5 \end{array}$	$\begin{array}{ccccc} & & 2 & 3 & \\ & 3 & 6 & 4 & 7 \\ & & & \times & 5 \\ \hline & & & 3 & 5 \end{array}$	$\begin{array}{ccccc} & 3 & 2 & 3 & \\ & 3 & 6 & 4 & 7 \\ & & & \times & 5 \\ \hline & & 2 & 3 & 5 \end{array}$	$\begin{array}{ccccc} & 3 & 2 & 3 & \\ & 3 & 6 & 4 & 7 \\ & & & \times & 5 \\ \hline 1 & 8 & 2 & 3 & 5 \end{array}$

DISCUSSION EXERCISES

1. Explain why you need not learn anything new to work the example above.

2. Explain each of the steps in the example.

EXERCISES

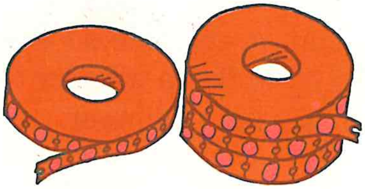
Find the products.

1. 924 ×3	**2.** 913 ×2	**3.** 480 ×4	**4.** 693 ×2	**5.** 554 ×4
6. 271 ×2	**7.** 185 ×3	**8.** 303 ×4	**9.** 244 ×6	**10.** 908 ×2
11. 817 ×5	**12.** 905 ×5	**13.** 272 ×3	**14.** 708 ×2	**15.** 894 ×3
16. 9142 ×4	**17.** 5068 ×2	**18.** 7625 ×3	**19.** 6369 ×4	**20.** 4179 ×6
21. 8346 ×6	**22.** 7037 ×2	**23.** 6305 ×3	**24.** 3648 ×4	**25.** 7296 ×5
26. 7514 ×5	**27.** 5007 ×9	**28.** 5230 ×7	**29.** 7626 ×4	**30.** 7809 ×7

★ Find the products.

1. 86,194 ×2	**2.** 96,824 ×4	**3.** 48,057 ×6	**4.** 60,795 ×3	**5.** 35,678 ×5

Short stories



1. 4 rolls of tickets.
   375 tickets on each roll.
   How many tickets?

2. 4840 square yards in an acre.
   How many square yards in 7 acres?

3. 64 pints in 1 bushel.
   How many pints in 3 bushels?

4. 36 inches in 1 yard.
   How many inches in 5 yards?

5. If 3 years had 365 days each,
   how many days would this be in all?

6. 168 hours in 1 week.
   How many hours in 8 weeks?

7. 5280 feet in 1 mile.
   How many feet in 2 miles?

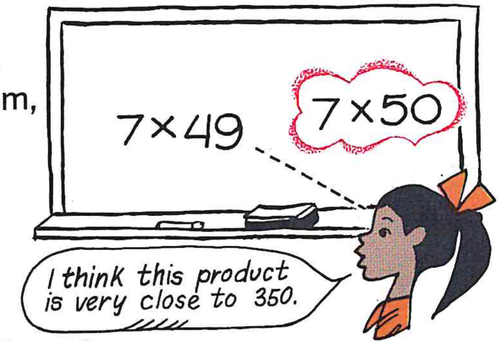
★ 8. [A] 3600 seconds in 1 hour.
   How many seconds in 8 hours?

   [B] Three 8-hour periods make 1 day.
   How many seconds in a day?

   [C] 7 days in 1 week.
   How many seconds in 1 week?

Estimating products

Sara is estimating the product 7 × 49. When we estimate an answer to a problem, we try to find a number that is "close" to the correct answer.


7×49
7×50
I think this product is very close to 350.

Sara

DISCUSSION EXERCISES

1. Explain how Sara found an estimate for 7 × 49.

2. Find the product in the red cloud. Explain why this is a "good estimate" of the product below.

[A] 4 × 50
4 × 51

[B] 3 × 40
3 × 39

[C] 12 × 100
12 × 99

[D] 6 × 200
6 × 204

3. Give an estimate for each product. Explain how you found your estimate.

[A] 3 × 69 [B] 5 × 38 [C] 7 × 21 [D] 6 × 98 [E] 7 × 297

EXERCISES

1. Find the product in the red cloud. Tell whether or not it is a "good estimate" of the product below.

[A] 5 × 60
5 × 62

[B] 2 × 70
2 × 79

[C] 6 × 50
6 × 48

[D] 7 × 90
7 × 81

2. Estimate each product.

[A] 3 × 82
[B] 4 × 69
[C] 8 × 99
[D] 25 × 99
[E] 38 × 101
[F] 6 × 61
[G] 7 × 29
[H] 3 × 91
[I] 5 × 199
[J] 6 × 58
[K] 2 × 197
[L] 4 × 299
[M] 5 × 302
[N] 8 × 493
[O] 7 × 502

Making the best guess

There are 3 answers after each question.
One of them is very close to the right answer.
You are to decide which answer is best.

1. An airplane flew 502 miles each hour for 4 hours. About how many miles did it fly? [A] 100 [B] 2000 [C] 750

2. An orchard has 8 rows of trees with 49 trees in each row. About how many trees are in this orchard?
[A] 100 [B] 500 [C] 400

3. Each of 6 books has 312 pages. About how many pages are there in all? [A] 2000 [B] 600 [C] 3000

4. If there are 365 days in each of 3 years, about how many days is this in all? [A] 100 [B] 1000 [C] 10,000

5. There are 5280 feet in 1 mile. About how many feet are in 2 miles? [A] 1000 [B] 100,000 [C] 10,000

6. There are 36 inches in a yard. About how many inches are in 9 yards? [A] 100 [B] 350 [C] 1000

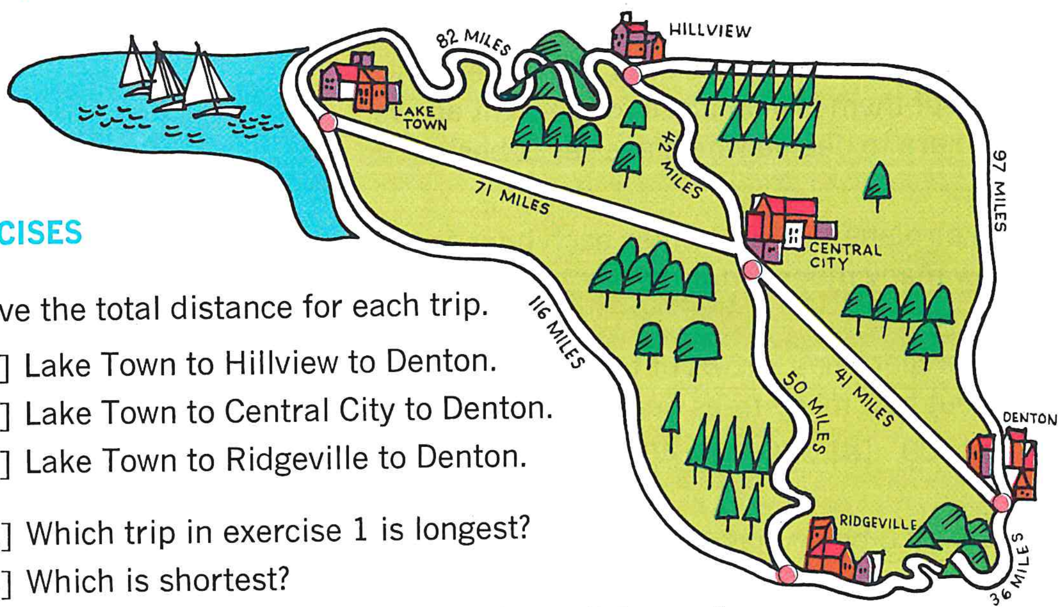
7. There are 8 pints in 1 gallon. About how many pints are in 98 gallons? [A] 100 [B] 8000 [C] 800

★ 8. There are 52 weeks in a year. About how many weeks are in $2\frac{1}{2}$ years? [A] 100 [B] 200 [C] 125

★ 9. There are 60 minutes in an hour. About how many minutes are in $8\frac{1}{4}$ hours? [A] 450 [B] 500 [C] 550

★ 10. There are 1760 yards in a mile. About how many yards are in $2\frac{1}{2}$ miles? [A] 4500 [B] 3500 [C] 5000

Map problems



EXERCISES

1. Give the total distance for each trip.

   [A] Lake Town to Hillview to Denton.
   [B] Lake Town to Central City to Denton.
   [C] Lake Town to Ridgeville to Denton.

2. [A] Which trip in exercise 1 is longest?
   [B] Which is shortest?
   [C] What is the difference between these distances?

3. How long is a trip that is 4 times as far as from Hillview to Denton?

4. For each exercise, tell which trip is farther. How much farther?

   [A] Lake Town to Central City or Lake Town to Ridgeville
   [B] Hillview to Denton or Hillview to Lake Town
   [C] Central City to Ridgeville or Central City to Hillview
   [D] Central City to Ridgeville or Central City to Lake Town

★ 5. A salesman made 3 trips from Lake Town to Ridgeville and back. How far did he travel?

★ 6. Give the total distance for each trip.

   [A] Central City to Ridgeville to Denton to Hillview
   [B] Lake Town to Ridgeville to Central City to Hillview
   [C] Denton to Ridgeville to Lake Town to Hillview
   [D] Hillview to Lake Town to Ridgeville to Denton
   [E] Central City to Denton to Ridgeville to Central City to Hillview to Lake Town

★Two 2-digit factors

DISCUSSION EXERCISES

1. Find each product and explain your work.

[A] Since $23 \times 4 = 92$, we know that $23 \times 4 \times 10 = \boxed{n}$.

[B] Since $36 \times 7 = 252$, we know that $36 \times 7 \times 10 = \boxed{n}$.

[C] Since $23 \times 4 = 92$, we know that $23 \times 40 = \boxed{n}$.

[D] Since $79 \times 3 = 237$, we know that $79 \times 30 = \boxed{n}$.

[E] Since $58 \times 6 = 348$, we know that $58 \times 60 = \boxed{n}$.

[F] $\begin{array}{r} 93 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 93 \\ \times 50 \\ \hline \end{array}$ [G] $\begin{array}{r} 86 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 86 \\ \times 40 \\ \hline \end{array}$ [H] $\begin{array}{r} 67 \\ \times 8 \\ \hline \end{array}$ $\begin{array}{r} 67 \\ \times 80 \\ \hline \end{array}$

2. Explain each step in the example below.

$32 \times 54 = (30 \times 54) + (2 \times 54)$		
Step 1	Step 2	Step 3
$\begin{array}{r} 54 \\ \times 32 \\ \hline 108 \end{array}$	$\begin{array}{r} 54 \\ \times 32 \\ \hline 108 \\ 1620 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 32 \\ \hline 108 \\ 1620 \\ \hline 1728 \end{array}$
$2 \times 54 = 108$	$30 \times 54 = 1620$	$108 + 1620 = 1728$

EXERCISES

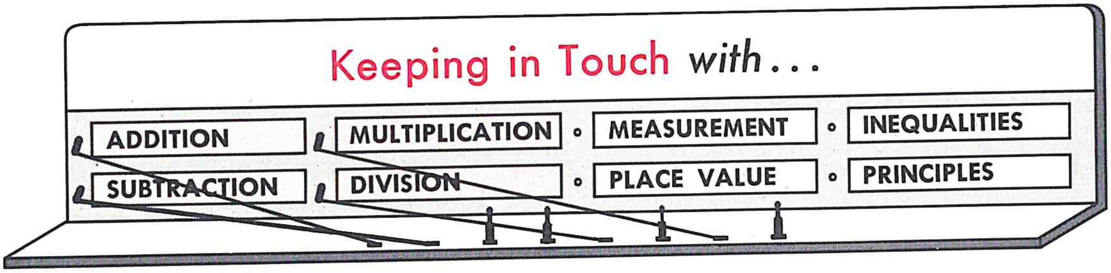
Find the products.

1. $\begin{array}{r} 34 \\ \times 26 \\ \hline \end{array}$ **2.** $\begin{array}{r} 58 \\ \times 12 \\ \hline \end{array}$ **3.** $\begin{array}{r} 43 \\ \times 51 \\ \hline \end{array}$ **4.** $\begin{array}{r} 64 \\ \times 52 \\ \hline \end{array}$ **5.** $\begin{array}{r} 31 \\ \times 26 \\ \hline \end{array}$ **6.** $\begin{array}{r} 55 \\ \times 23 \\ \hline \end{array}$

7. $\begin{array}{r} 64 \\ \times 75 \\ \hline \end{array}$ **8.** $\begin{array}{r} 62 \\ \times 17 \\ \hline \end{array}$ **9.** $\begin{array}{r} 83 \\ \times 25 \\ \hline \end{array}$ **10.** $\begin{array}{r} 65 \\ \times 22 \\ \hline \end{array}$ **11.** $\begin{array}{r} 34 \\ \times 75 \\ \hline \end{array}$ **12.** $\begin{array}{r} 69 \\ \times 27 \\ \hline \end{array}$

13. $\begin{array}{r} 83 \\ \times 42 \\ \hline \end{array}$ **14.** $\begin{array}{r} 95 \\ \times 27 \\ \hline \end{array}$ **15.** $\begin{array}{r} 63 \\ \times 36 \\ \hline \end{array}$ **16.** $\begin{array}{r} 89 \\ \times 27 \\ \hline \end{array}$ **17.** $\begin{array}{r} 59 \\ \times 87 \\ \hline \end{array}$ **18.** $\begin{array}{r} 69 \\ \times 27 \\ \hline \end{array}$

Keeping in Touch with . . .



1. Find the sums and differences.

[A] $\begin{array}{r} 34 \\ +51 \\ \hline \end{array}$ [B] $\begin{array}{r} 76 \\ -24 \\ \hline \end{array}$ [C] $\begin{array}{r} 67 \\ +12 \\ \hline \end{array}$ [D] $\begin{array}{r} 87 \\ -32 \\ \hline \end{array}$ [E] $\begin{array}{r} 15 \\ +84 \\ \hline \end{array}$ [F] $\begin{array}{r} 95 \\ -13 \\ \hline \end{array}$

[G] $\begin{array}{r} 67 \\ +89 \\ \hline \end{array}$ [H] $\begin{array}{r} 132 \\ -57 \\ \hline \end{array}$ [I] $\begin{array}{r} 76 \\ +98 \\ \hline \end{array}$ [J] $\begin{array}{r} 161 \\ -82 \\ \hline \end{array}$ [K] $\begin{array}{r} 85 \\ +67 \\ \hline \end{array}$ [L] $\begin{array}{r} 153 \\ -95 \\ \hline \end{array}$

2. Find the missing factors.

[A] $6 \times \boxed{n} = 42$ [G] $6 \times \boxed{n} = 48$ [M] $3 \times \boxed{n} = 27$ [S] $9 \times \boxed{n} = 0$

[B] $\boxed{n} \times 5 = 15$ [H] $\boxed{n} \times 4 = 36$ [N] $6 \times \boxed{n} = 36$ [T] $7 \times \boxed{n} = 49$

[C] $8 \times \boxed{n} = 32$ [I] $\boxed{n} \times 5 = 35$ [O] $\boxed{n} \times 7 = 42$ [U] $\boxed{n} \times 3 = 9$

[D] $6 \times \boxed{n} = 30$ [J] $9 \times \boxed{n} = 18$ [P] $\boxed{n} \times 9 = 81$ [V] $\boxed{n} \times 1 = 0$

[E] $\boxed{n} \times 3 = 21$ [K] $\boxed{n} \times 5 = 25$ [Q] $6 \times \boxed{n} = 24$ [W] $8 \times \boxed{n} = 64$

[F] $\boxed{n} \times 2 = 8$ [L] $\boxed{n} \times 8 = 40$ [R] $\boxed{n} \times 7 = 28$ [X] $\boxed{n} \times 9 = 54$

3. Find the quotients.

[A] Since $8 \times 9 = 72$, we know that $72 \div 9 = \boxed{n}$.

[B] Since $8 \times 9 = 72$, we know that $72 \div 8 = \boxed{n}$.

[C] Since $6 \times 8 = 48$, we know that $48 \div 6 = \boxed{n}$.

[D] Since $10 \times 27 = 270$, we know that $270 \div 27 = \boxed{n}$.

[E] Since $6 \times 15 = 90$, we know that $90 \div 6 = \boxed{n}$.

★ **4.** Copy the problems and give the missing digits.

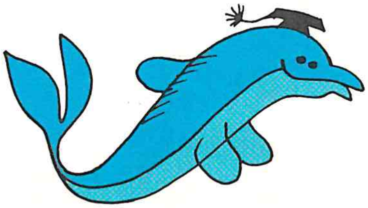
[A] $\begin{array}{r} 59 \\ -▨▨ \\ \hline 28 \end{array}$ [B] $\begin{array}{r} 39 \\ +6▨ \\ \hline ▨▨6 \end{array}$ [C] $\begin{array}{r} 83 \\ -3▨ \\ \hline ▨6 \end{array}$ [D] $\begin{array}{r} 23 \\ \times ▨ \\ \hline 46 \end{array}$ [E] $\begin{array}{r} ▨9▨ \\ +3▨8 \\ \hline 860 \end{array}$ [F] $\begin{array}{r} ▨▨ \\ \times 6 \\ \hline 252 \end{array}$

5. Find the quotients.

[A] $12 \div 4$
[B] $20 \div 5$
[C] $12 \div 3$
[D] $18 \div 6$
[E] $10 \div 2$
[F] $15 \div 5$
[G] $16 \div 4$
[H] $18 \div 3$
[I] $12 \div 2$
[J] $30 \div 5$
[K] $24 \div 6$
[L] $15 \div 3$
[M] $8 \div 4$
[N] $14 \div 7$
[O] $10 \div 5$
[P] $20 \div 4$
[Q] $9 \div 3$
[R] $8 \div 2$
[S] $12 \div 6$
[T] $25 \div 5$
[U] $24 \div 8$
[V] $21 \div 3$
[W] $28 \div 4$
[X] $36 \div 9$
[Y] $30 \div 6$
[Z] $35 \div 5$

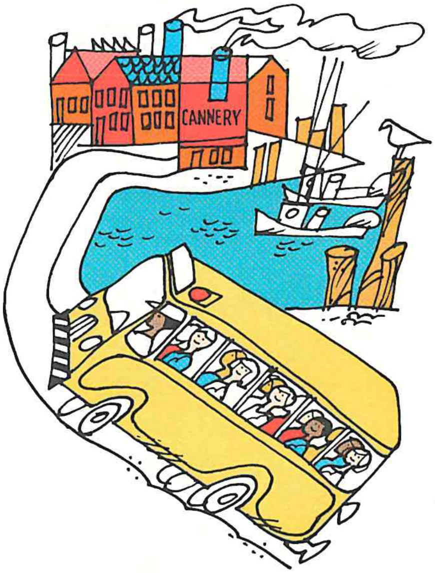
Think

There are 16 third-graders in Pam's club at school. There are 5 third-grade teachers in the school. Explain why at least 4 of the third-grade children have the same teacher.



6. The third-grade children from West School visited the canning factory. There were 52 girls and 35 boys in the group. They left at 9 o'clock in the morning and returned at 2 o'clock in the afternoon.

[A] How many children went on the trip?
[B] How many more girls went than boys?
[C] How long did their trip last?
[D] Only 23 girls rode the bus. How many did not ride the bus?
[E] The bus was full and held 51 children. How many boys rode the bus?
[F] The boys visited one room in groups of 7. How many groups of 7 boys were there?
[G] Each of the girls got 7 souvenir pencils. How many pencils did they get in all?
[H] Each of the boys got 7 souvenir pencils. How many pencils did they get in all?
[I] How many more pencils did the girls get than the boys?
[J] How many pencils did the children receive in all?



Chapter review

1. Solve the equations.

[A] $4 \times 28 = (4 \times 20) + (4 \times \boxed{n})$
[B] $2 \times 54 = (2 \times 50) + (2 \times \boxed{n})$
[C] $3 \times 65 = (3 \times \boxed{n}) + (3 \times 5)$
[D] $7 \times 18 = (7 \times \boxed{n}) + (7 \times 8)$
[E] $6 \times 51 = (6 \times 50) + (6 \times \boxed{n})$
[F] $8 \times 46 = (8 \times \boxed{n}) + (8 \times 6)$

2. Find the products.

[A] 100×18
[B] 78×10
[C] 6×100
[D] 2×10
[E] 10×136
[F] 37×10
[G] 100×24
[H] 75×100
[I] 20×10
[J] 75×10
[K] 10×23
[L] 4×100

3. Find the products.

[A] 3×20
[B] 3×40
[C] 5×50
[D] 6×30
[E] 2×80
[F] 9×20
[G] 7×20
[H] 4×30
[I] 5×60
[J] 3×70
[K] 2×90
[L] 4×60

4. Find the products and sums.

[A] $3 \times 20 = \boxed{n}$
$3 \times 4 = \boxed{n}$
$(3 \times 20) + (3 \times 4) = \boxed{n}$
$3 \times 24 = \boxed{n}$

[B] $4 \times 30 = \boxed{n}$
$4 \times 6 = \boxed{n}$
$(4 \times 30) + (4 \times 6) = \boxed{n}$
$4 \times 36 = \boxed{n}$

5. Find the products.

[A] $\begin{array}{r} 23 \\ \times 2 \\ \hline \end{array}$
[B] $\begin{array}{r} 14 \\ \times 2 \\ \hline \end{array}$
[C] $\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$
[D] $\begin{array}{r} 12 \\ \times 4 \\ \hline \end{array}$
[E] $\begin{array}{r} 11 \\ \times 5 \\ \hline \end{array}$
[F] $\begin{array}{r} 43 \\ \times 2 \\ \hline \end{array}$
[G] $\begin{array}{r} 13 \\ \times 3 \\ \hline \end{array}$
[H] $\begin{array}{r} 22 \\ \times 4 \\ \hline \end{array}$
[I] $\begin{array}{r} 33 \\ \times 2 \\ \hline \end{array}$
[J] $\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array}$
[K] $\begin{array}{r} 11 \\ \times 6 \\ \hline \end{array}$
[L] $\begin{array}{r} 12 \\ \times 3 \\ \hline \end{array}$

6. Find the products.

[A] $\begin{array}{r} 37 \\ \times 4 \\ \hline \end{array}$
[B] $\begin{array}{r} 46 \\ \times 3 \\ \hline \end{array}$
[C] $\begin{array}{r} 25 \\ \times 2 \\ \hline \end{array}$
[D] $\begin{array}{r} 39 \\ \times 5 \\ \hline \end{array}$
[E] $\begin{array}{r} 43 \\ \times 6 \\ \hline \end{array}$
[F] $\begin{array}{r} 62 \\ \times 4 \\ \hline \end{array}$
[G] $\begin{array}{r} 923 \\ \times 3 \\ \hline \end{array}$
[H] $\begin{array}{r} 849 \\ \times 4 \\ \hline \end{array}$
[I] $\begin{array}{r} 965 \\ \times 2 \\ \hline \end{array}$
[J] $\begin{array}{r} 438 \\ \times 3 \\ \hline \end{array}$
[K] $\begin{array}{r} 4092 \\ \times 4 \\ \hline \end{array}$
[L] $\begin{array}{r} 2958 \\ \times 5 \\ \hline \end{array}$

★ **7.** Complete each sentence.

[A] Since $4 \times 27 = 108$, we know that $5 \times 27 = 108 + \boxed{n}$.

[B] Since $6 \times 78 = 468$, we know that $7 \times 78 = 468 + \boxed{n}$.

[C] Since $6 \times 78 = 468$, we know that $5 \times 78 = 468 - \boxed{n}$.

[D] Since $9 \times 57 = 513$, we know that $8 \times 57 = 513 - \boxed{n}$.

[E] Since $7 \times 83 = 581$, we know that $8 \times 83 = 581 + \boxed{n}$.

[F] Since $8 \times 47 = 376$, we know that $7 \times 47 = 376 - \boxed{n}$.

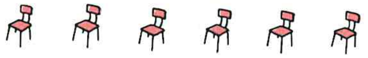
[G] Since $4 \times 348 = 1392$, we know that $5 \times 348 = 1392 + \boxed{n}$.

[H] Since $9 \times 176 = 1584$, we know that $8 \times 176 = 1584 - \boxed{n}$.

[I] Since $27 \times 38 = 1026$, we know that $28 \times 38 = 1026 + \boxed{n}$.

[J] Since $85 \times 67 = 5695$, we know that $84 \times 67 = 5695 - \boxed{n}$.

Short stories

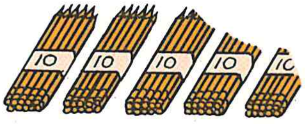


1. 13 rows of chairs.
6 chairs in each row.
How many chairs?

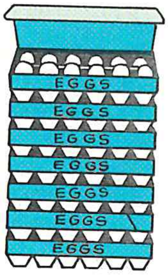
2. 3 classes of children.
34 children in each class.
How many children?

3. 427 pages in each book.
7 books.
How many pages?

4. 36 rooms on each floor.
9 floors.
How many rooms?



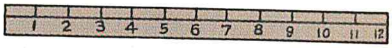
5. 10 pencils in each bundle.
68 bundles.
How many pencils?



6. 7 dozen eggs.
How many eggs?

7. 4 cups in a quart.
83 quarts.
How many cups?

8. 12 inches in a foot.
7 feet.
How many inches?



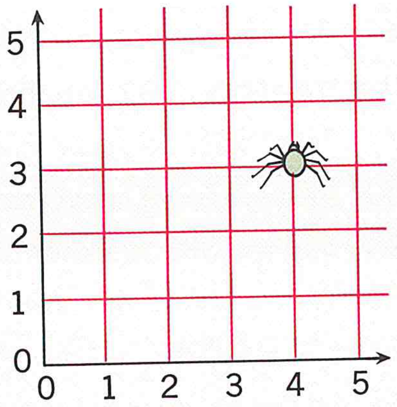
9. 36 inches in a yard.
How many inches in 10 yards?

10. 100 yard dash.
3 feet per yard.
How many feet in the dash?

COORDINATE GEOMETRY Unit 4

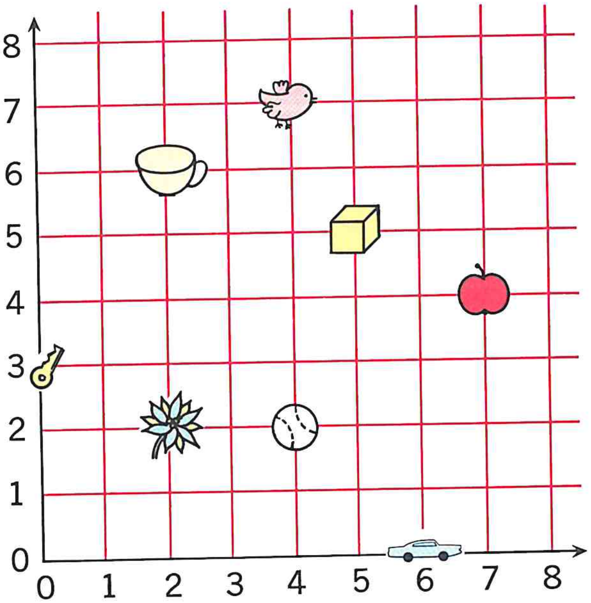
Using coordinates

Where is the spider?
"4 over and 3 up"
Its coordinates are (4, 3).



In this lesson you will learn to use coordinates (number pairs) for locations.

1. Give the missing numbers. Then give the coordinates.



[A] The ball is 4 over and ▥ up. The coordinates for the ball are _?_.

[B] The bird is ▥ over and 7 up. The coordinates for the bird are _?_.

[C] The apple is 7 over and ▥ up. The coordinates for the apple are _?_.

[D] The car is 6 over and ▥ up. The coordinates for the car are _?_.

[E] The block is ▥ over and 5 up. The coordinates for the block are _?_.

[F] The key is 0 over and ▥ up. The coordinates for the key are _?_.

[G] What are the coordinates for the cup?

[H] Give the coordinates for the flower.

2. [**A**] What letter is 7 over and 4 up?

[**B**] What letter is 3 over and 7 up?

[**C**] What letter has coordinates (7, 4)?

[**D**] What letter has coordinates (3, 7)?

[**E**] What letter is at (4, 4)?

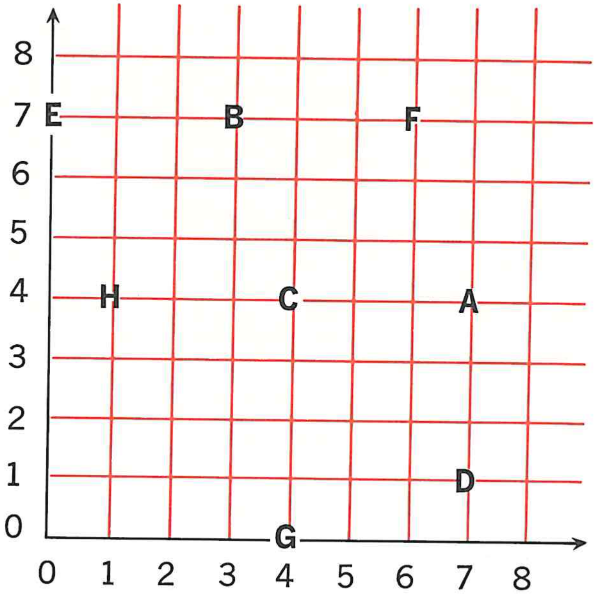
[**F**] What letter is at (1, 4)?

[**G**] What letter is at (4, 0)?

[**H**] Coordinates (0, 7) locate what letter?

[**I**] What do you find at (6, 7)?

[**J**] Coordinates (7, 1) locate what letter?

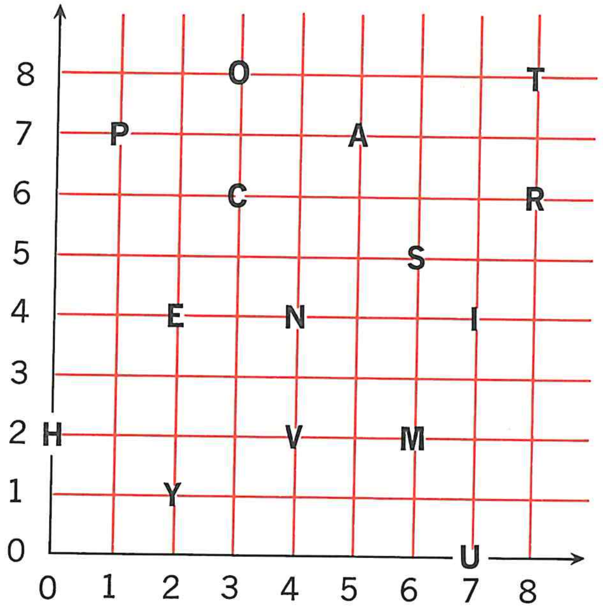


3. The letters for the 3 sets of coordinates below form a secret message. See if you can find the message.

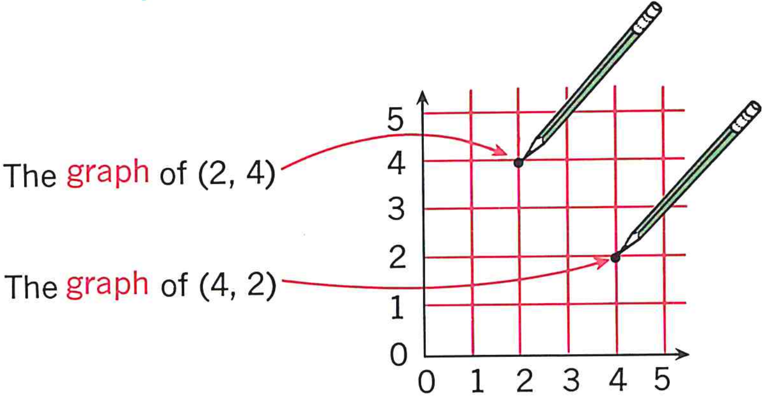
(0, 2), (5, 7), (1, 7), (1, 7), (2, 1)

(6, 5), (7, 0), (6, 2), (6, 2), (2, 4), (8, 6)

(4, 2), (5, 7), (3, 6), (5, 7), (8, 8), (7, 4), (3, 8), (4, 4)

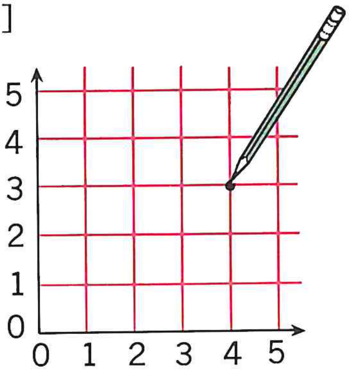


Graphing number pairs

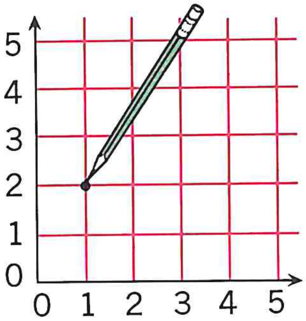


1. Each figure below shows a point being graphed. Give the coordinates of that point.

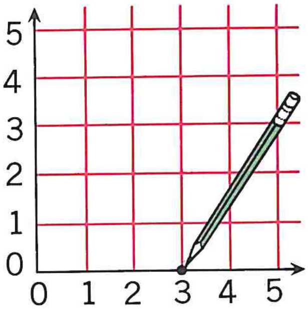
[A]



[B]



[C]



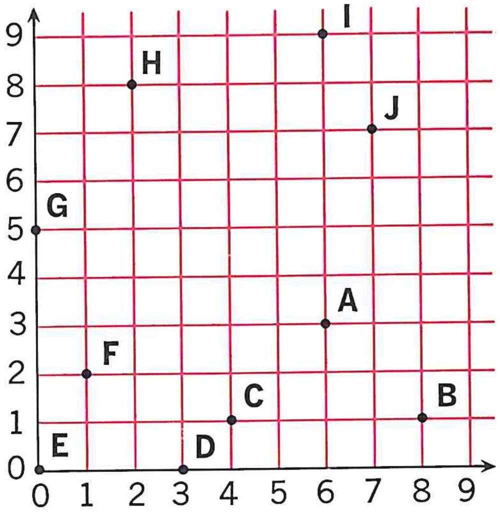
2. Give the coordinates for each point **A** through **F**.

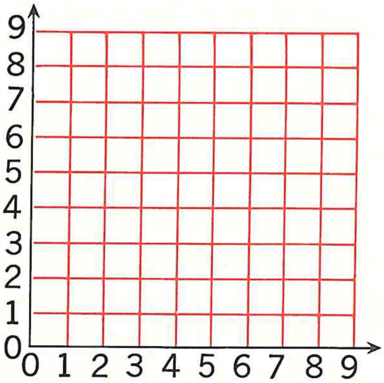
3. [A] Which point has coordinates (6, 9)?

[B] Coordinates (0, 5) locate what point?

[C] What point is at (2, 8)?

[D] Give the point for (7, 7).





4. The figure on the right is called a pair of coordinate axes. Each number line is called an axis. The red grid is given to help locate points. Draw a pair of coordinate axes on your paper.

5. Use your coordinate axes from exercise 4 to graph and label each of the following coordinates. Label the first point **A**, the second **B**, and so on.

[A] (7, 3) [B] (3, 7) [C] (5, 5) [D] (3, 9) [E] (0, 3) [F] (5, 0)

6. Draw a pair of coordinate axes like those in exercise 4.

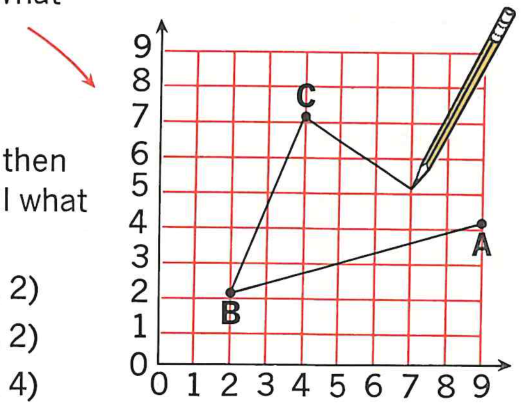
[A] Graph all the points that have coordinates with 7 as their first number:

$\{(7, 0), (7, 1), (7, 2), \ldots\}$

[B] On the same figure graph all the points that have 3 as their second number.

[C] What are the coordinates of the point that is in both sets?

7. The figure shows points **A**, **B**, and **C** being connected to form a geometric figure. What is this figure?



8. For each exercise, graph the points and then connect them in this order: **ABCDA**. Tell what figure is formed.

[A] **A**: (3, 2); **B**: (3, 6); **C**: (7, 6); **D**: (7, 2)

[B] **A**: (2, 2); **B**: (4, 6); **C**: (9, 6); **D**: (7, 2)

[C] **A**: (1, 4); **B**: (1, 7); **C**: (8, 7); **D**: (8, 4)

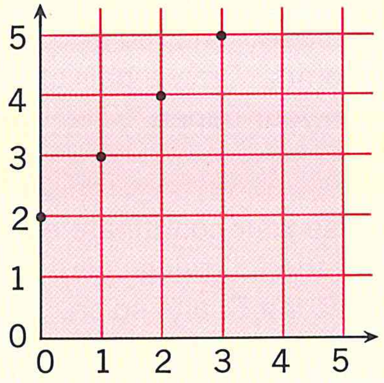
★Graphing functions

Function Rule

Add 2

Input	Output	Coordinates
0	2	(0, 2)
1	3	(1, 3)
2	4	(2, 4)
3	5	(3, 5)

Graph



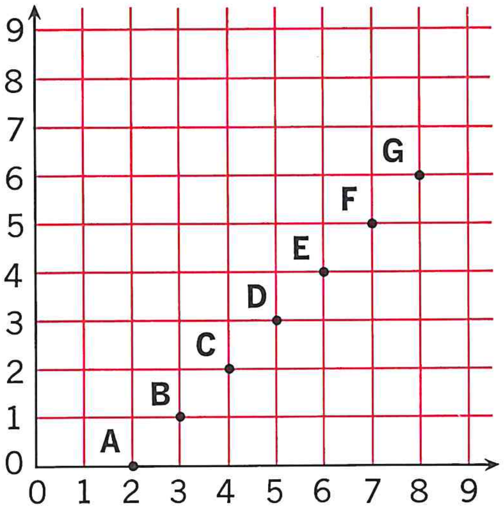
EXERCISES

1. Give the missing coordinates. Then give the coordinates for each point in the graph. The two sets of coordinates should be the same.

Function Rule

Subtract 2

Input	Output	Coordinates
2	0	(2, 0)
3	1	(3, 1)
4	2	(4, ▯)
5	3	(▯, ▯)
6	4	(▯, ▯)
7	5	(▯, ▯)
8	6	(▯, ▯)



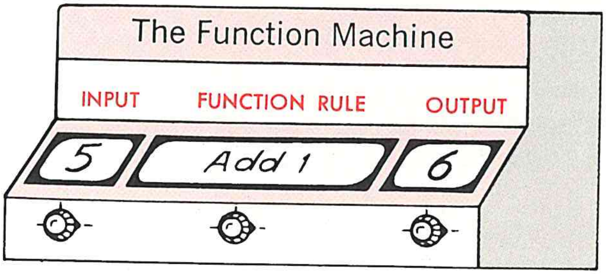
2. What would you expect the coordinates of a point **H** to be?

3. [**A**] Think about the function machine and give the number for each row of the table.

Function Rule

Add 1

Input	Output
0	▥
1	▥
2	▥
3	▥
4	▥
5	▥
6	▥



[**B**] List the set of coordinates for this table.

[**C**] Draw the graph for this set of coordinates.

4. Give the missing numbers for each function table. Then list the set of coordinates. Finally, draw the graph for each set of coordinates.

[**A**] Function Rule

Subtract 1

Input	Output
1	▥
2	▥
3	▥
4	▥
5	▥
6	▥
7	▥
8	▥

[**B**] Function Rule

Multiply by 1

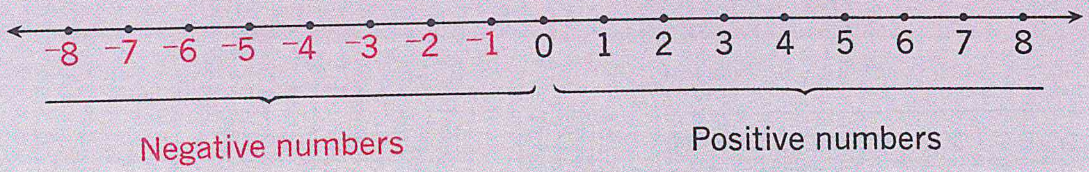
Input	Output
0	▥
1	▥
2	▥
3	▥
4	▥
5	▥
6	▥
7	▥

[**C**] Function Rule

Subtract from 7

Input	Output
0	7
1	6
2	5
3	4
4	▥
5	▥
6	▥
7	▥

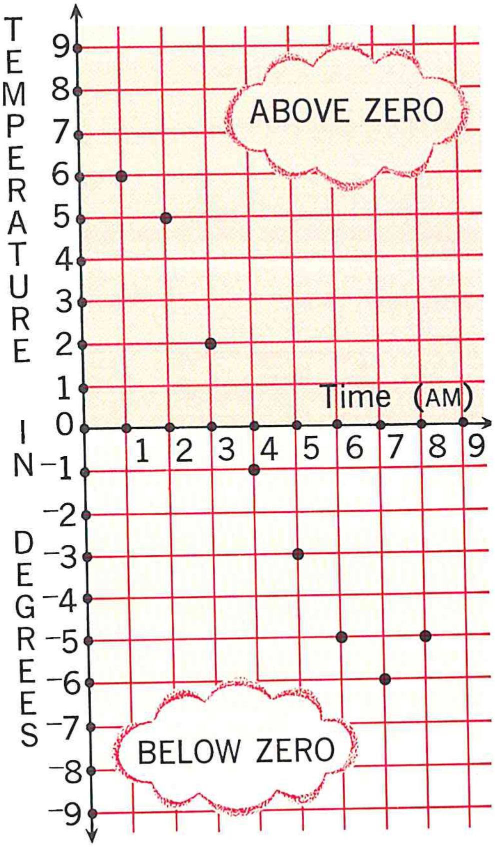
★ Negative numbers and graphing



Read: Negative one, negative two, negative three, . . .

EXERCISES

1. Alice made a graph to show the temperature from 1:00 A.M. to 8:00 A.M. on a very cold day. She used **negative** numbers to show temperatures **below** zero and positive numbers to show temperatures **above** zero.



[A] What was the temperature at 1:00 A.M.?

[B] What was the temperature at 2:00 A.M.?

[C] When was the temperature 2 degrees?

[D] What would the coordinates (4, ⁻1) tell you?

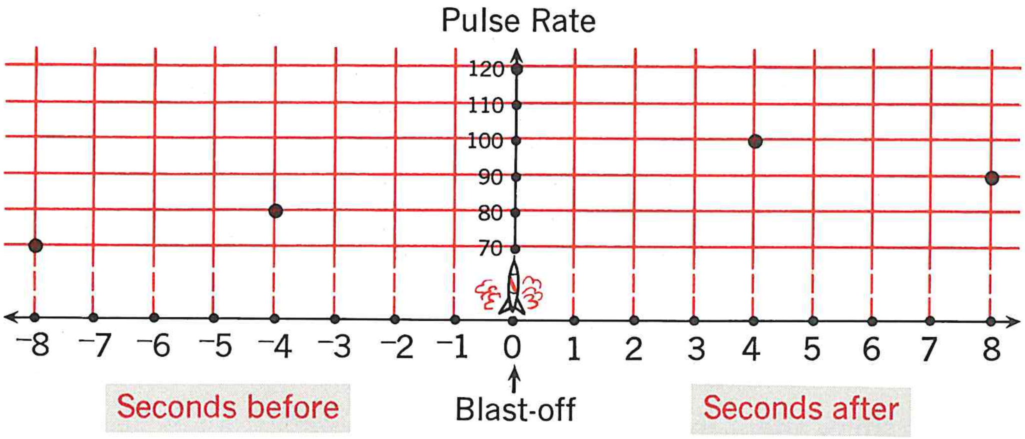
[E] At what time was the temperature 3 degrees below zero?

[F] What are the coordinates of that point?

[G] What are the coordinates for the coldest point shown on the graph?

[H] Look at the graph and **guess** what the temperature would be at 9:00 A.M.

2. Ted made this graph to show the changes in pulse rate of an astronaut around blast-off time. He used **negative** numbers for the seconds **before** blast-off and positive numbers for the seconds **after** blast-off.



[A] What was the pulse rate 8 seconds before blast-off? What are the coordinates of that point?

[B] Give the coordinates for the pulse rate 4 seconds before blast-off.

[C] What was the pulse rate at blast-off? Give the coordinates of that point.

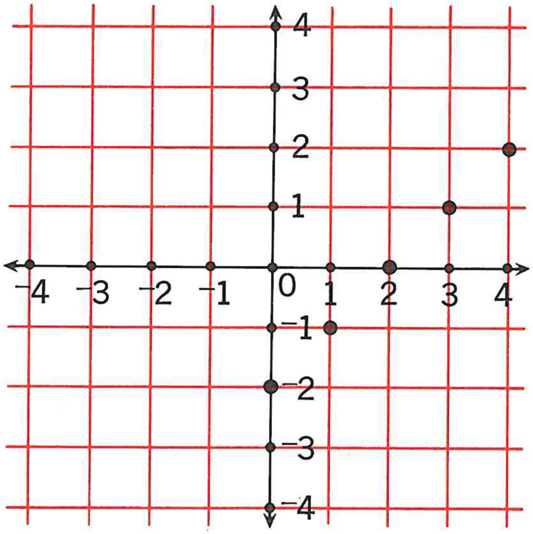
[D] Give the coordinates for each of the other points on Ted's graph.

3. Give the missing numbers in the table. The graph may help you.

Function Rule

Subtract 2

Input	Output
4	2
3	1
2	0
1	▥
0	▥



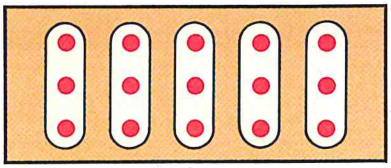
CHAPTER 9 Dividing

Understanding division

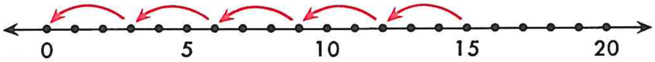
Here are some different ways you can think about division.

① You can think about sets.

15 ÷ 3 asks the question:
How many threes in 15?



② You can think about the number line.



15 ÷ 3 asks the question: How many jumps of 3 to get from 15 to 0?

③ You can think about subtraction.

$15 - 3 = 12$

$12 - 3 = 9$

$9 - 3 = 6$

$6 - 3 = 3$

$3 - 3 = 0$

15 ÷ 3 asks the question:
How many threes must we
subtract to get from 15 to 0?

④ You can think about multiplication.

$? \times 3 = 15$

15 ÷ 3 asks the question: What number multiplied by 3 gives 15?

DISCUSSION EXERCISES

Show each of these methods for the following exercises.

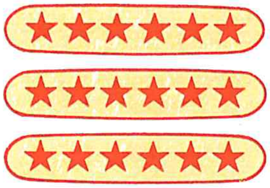
1. 18 ÷ 6

2. 20 ÷ 5

EXERCISES

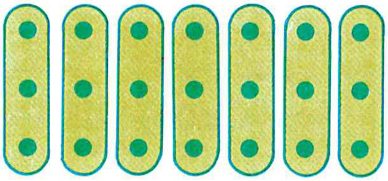
1. Write a division equation for each exercise.

[A]



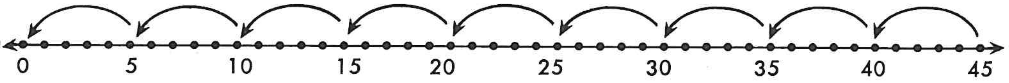
18 stars

[B]

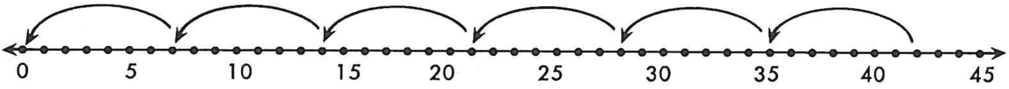


21 dots

[C]



[D]



[E] $30 - 6 = 24$
$24 - 6 = 18$
$18 - 6 = 12$
$12 - 6 = 6$
$6 - 6 = 0$

[F] $24 - 8 = 16$
$16 - 8 = 8$
$8 - 8 = 0$

[G] $20 - 5 = 15$
$15 - 5 = 10$
$10 - 5 = 5$
$5 - 5 = 0$

[H] $3 \times 4 = 12$
[I] $9 \times 8 = 72$
[J] $5 \times 7 = 35$
[K] $7 \times 4 = 28$

2. Find the products.

[A] 5×7
[B] 3×8
[C] 6×7
[D] 5×5
[E] 3×9
[F] 4×8
[G] 2×5
[H] 1×8
[I] 0×8
[J] 5×4
[K] 6×6
[L] 2×9
[M] 3×7
[N] 5×6
[O] 7×3
[P] 1×7
[Q] 6×4
[R] 5×9
[S] 0×6
[T] 4×7
[U] 8×0
[V] 1×9
[W] 8×3
[X] 9×4
[Y] 6×8

3. Find the quotients.

[A] $18 \div 9$
[B] $7 \div 7$
[C] $20 \div 4$
[D] $25 \div 5$
[E] $42 \div 7$
[F] $0 \div 8$
[G] $21 \div 3$
[H] $48 \div 6$
[I] $24 \div 8$
[J] $24 \div 4$
[K] $36 \div 6$
[L] $27 \div 9$
[M] $24 \div 6$
[N] $21 \div 7$
[O] $30 \div 6$
[P] $28 \div 7$
[Q] $36 \div 4$
[R] $45 \div 9$
[S] $18 \div 2$
[T] $32 \div 8$
[U] $35 \div 7$
[V] $10 \div 5$
[W] $8 \div 8$
[X] $0 \div 6$

Quotients with zero endings

Study these equations.

$$7 \times 4 = 28 \longrightarrow 28 \div 4 = 7$$
$$70 \times 4 = 280 \longrightarrow 280 \div 4 = 70$$
$$700 \times 4 = 2800 \longrightarrow 2800 \div 4 = 700$$

$$6 \times 9 = 54 \longrightarrow 54 \div 6 = 9$$
$$6 \times 90 = 540 \longrightarrow 540 \div 6 = 90$$
$$6 \times 900 = 5400 \longrightarrow 5400 \div 6 = 900$$

EXERCISES

1. Find the products.

[A] 5×9
[B] 6×3
[C] 4×5
[D] 4×8
[E] 3×7
[F] 9×9
[G] 3×8
[H] 8×8
[I] 4×6
[J] 3×9
[K] 5×7
[L] 6×8
[M] 9×4
[N] 6×5
[O] 7×8
[P] 7×4
[Q] 8×5
[R] 6×6
[S] 5×5
[T] 7×6
[U] 9×7
[V] 7×7
[W] 5×3
[X] 9×8
[Y] 7×9

2. Find the quotients.

[A] $49 \div 7$
[B] $28 \div 4$
[C] $27 \div 9$
[D] $32 \div 8$
[E] $20 \div 5$
[F] $24 \div 6$
[G] $56 \div 8$
[H] $72 \div 8$
[I] $15 \div 3$
[J] $40 \div 5$
[K] $35 \div 7$
[L] $21 \div 7$
[M] $18 \div 3$
[N] $64 \div 8$
[O] $30 \div 5$
[P] $42 \div 6$
[Q] $63 \div 7$
[R] $36 \div 6$
[S] $48 \div 8$
[T] $81 \div 9$
[U] $45 \div 9$
[V] $24 \div 8$
[W] $36 \div 4$
[X] $25 \div 5$
[Y] $63 \div 9$

3. Find the products.

[A] 5×90
[B] 80×8
[C] 7×80
[D] 70×7
[E] 3×30
[F] 70×6
[G] 6×50
[H] 5×50
[I] 90×4
[J] 3×80
[K] 30×5
[L] 9×70
[M] 60×6
[N] 8×50
[O] 30×9
[P] 50×7
[Q] 6×80
[R] 30×2
[S] 60×3
[T] 8×80
[U] 40×5
[V] 4×80
[W] 30×7
[X] 6×40
[Y] 5×60

4. Find the quotients.

[A] 210 ÷ 7
[B] 450 ÷ 5
[C] 640 ÷ 8
[D] 560 ÷ 7
[E] 300 ÷ 6
[F] 250 ÷ 5

[G] 360 ÷ 4
[H] 360 ÷ 6
[I] 400 ÷ 8
[J] 270 ÷ 9
[K] 180 ÷ 3
[L] 720 ÷ 9

[M] 200 ÷ 5
[N] 490 ÷ 7
[O] 900 ÷ 3
[P] 420 ÷ 6

[Q] 150 ÷ 5
[R] 630 ÷ 9
[S] 480 ÷ 6
[T] 320 ÷ 4

5. Find the products.

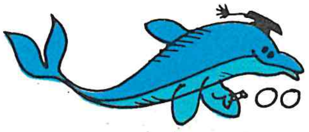
[A] 9 × 400
[B] 300 × 8
[C] 5 × 700
[D] 3 × 900
[E] 800 × 5
[F] 500 × 5

[G] 8 × 800
[H] 700 × 8
[I] 7 × 700
[J] 300 × 3
[K] 3 × 500
[L] 600 × 8

[M] 3 × 700
[N] 400 × 8
[O] 4 × 500
[P] 800 × 8
[Q] 6 × 300
[R] 6 × 600

Think

Now here's a simple rule
That should prove quite
a friend.
When you multiply by me,
Put two zeros on the end.



WHO AM I?

6. Find the missing factors.

[A] 5 × n = 350
[B] n × 7 = 490
[C] 4 × n = 200
[D] n × 6 = 420
[E] 9 × n = 630
[F] n × 8 = 640
[G] 3 × n = 90
[H] n × 9 = 270

[I] n × 8 = 2400
[J] 7 × n = 5600
[K] n × 8 = 3200
[L] 5 × n = 4500
[M] n × 2 = 600
[N] 6 × n = 1800
[O] n × 5 = 1500
[P] 8 × n = 4000

[Q] 9 × n = 450
[R] n × 8 = 6400
[S] 3 × n = 2100
[T] n × 5 = 300
[U] 6 × n = 2400
[V] n × 6 = 360
[W] 6 × n = 4800
[X] n × 5 = 250

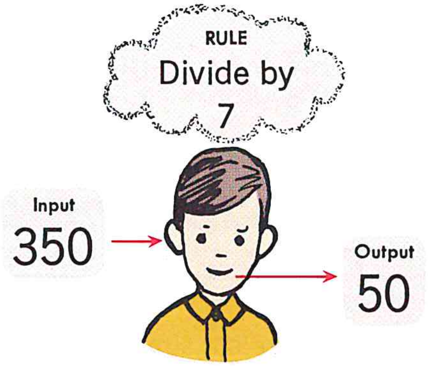
7. Find the quotients.

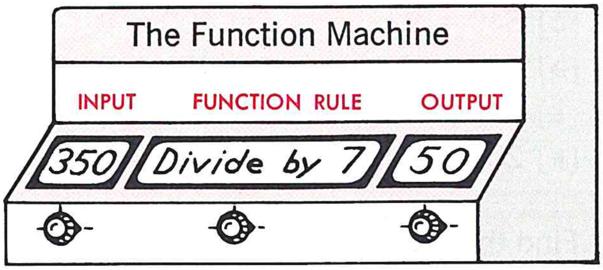
[A] 400 ÷ 8 = n
[B] 180 ÷ 6 = n
[C] 450 ÷ 5 = n
[D] 560 ÷ 7 = n
[E] 630 ÷ 7 = n
[F] 600 ÷ 3 = n
[G] 2400 ÷ 4 = n

[H] 3500 ÷ 5 = n
[I] 2000 ÷ 4 = n
[J] 6300 ÷ 9 = n
[K] 900 ÷ 3 = n
[L] 1800 ÷ 3 = n
[M] 360 ÷ 6 = n
[N] 90 ÷ 3 = n

[O] 2500 ÷ 5 = n
[P] 3600 ÷ 6 = n
[Q] 3000 ÷ 5 = n
[R] 640 ÷ 8 = n
[S] 4800 ÷ 8 = n
[T] 270 ÷ 3 = n
[U] 4000 ÷ 5 = n

The function machine





EXERCISES

Give what you think should go in each gray space.

1. Function Rule: Multiply by 10

	Input	Output
	15	150
[A]	24	
[B]	37	
[C]	48	
[D]		720

2. Function Rule: Multiply by 100

	Input	Output
	8	800
	23	2300
[A]	65	
[B]	83	
[C]		2800

3. Function Rule: [A]

	Input	Output
	9	360
	4	160
	6	240
[B]	5	
[C]		280

4. Function Rule: Divide by 4

	Input	Output
	8	20
[A]	280	
[B]	240	
[C]	120	
[D]	200	

5. Function Rule: Divide by 3

	Input	Output
	60	20
	180	60
[A]	240	
[B]	120	
[C]		30

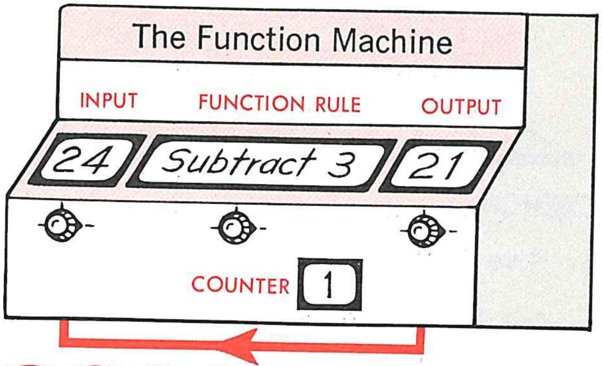
★ **6.** Function Rule: [A]

	Input	Output
	4	16
	5	25
	10	100
[B]	8	
[C]		49

★A special function machine

This function machine uses the output number as a new input number and keeps operating. A counter tells how many times the rule is used.

Here is a record of the machine's operations.



Function Rule: Subtract 3

24	21	18	15	12	9	6	3	0
Input	Output Numbers							

Counter: 8

EXERCISES

Here are more records. Give what you think should go in each gray space, then write a division equation for the exercise.

1. Function Rule: Subtract 4

24	20	[A]	12	[B]	4	[C]
Input						

Counter: 6

2. Function Rule: Subtract 6

42	36	[A]	[B]	18	12	[C]	0
Input							

Counter: [D]

3. Function Rule: Subtract [A]

40	[B]	30	[C]	20	15	10	[D]	0
Input								

Counter: [E]

4. Function Rule: Subtract 3

[A]	30	27	[B]	[C]	[D]	15	12	9	6	3	0
Input											

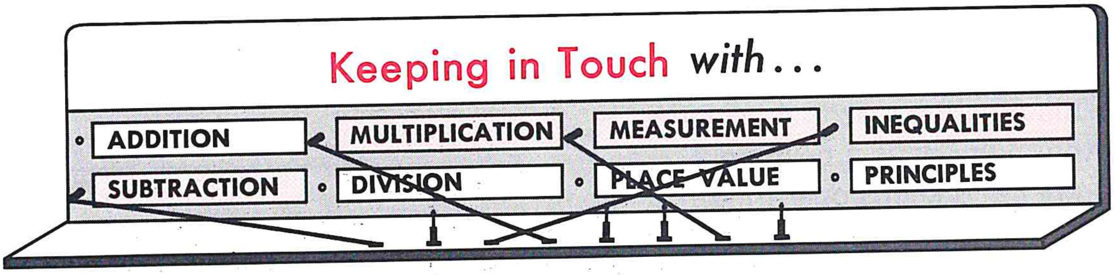
Counter: [E]

5. Function Rule: Subtract [A]

45	[B]	[C]	[D]	[E]	0
Input					

Counter: [F]

Keeping in Touch with...



EXERCISES

1. Give the mark (>, <, =) that should go in each ◍.

[A] 70 × 3 ◍ 3 × 70
[B] 3 × 40 ◍ 6 × 20
[C] 70 × 5 ◍ 9 × 40
[D] 99 × 4 ◍ 4 × 100
[E] 5 × 50 ◍ 6 × 40
[F] 98 × 7 ◍ 700
[G] 8 × 60 ◍ 70 × 7
[H] 700 × 8 ◍ 600 × 9
[I] 30 × 7 ◍ 70 × 3
[J] 800 × 9 ◍ 900 × 8
[K] 48 × 8 ◍ 8 × 53
[L] 34 × 5 ◍ 35 × 4

2. Find the missing factors.

[A] $\boxed{n} \times 6 = 240$
[B] $\boxed{n} \times 4 = 240$
[C] $4 \times \boxed{n} = 320$
[D] $8 \times \boxed{n} = 480$
[E] $\boxed{n} \times 9 = 360$
[F] $\boxed{n} \times 9 = 270$
[G] $\boxed{n} \times 7 = 350$
[H] $7 \times \boxed{n} = 420$
[I] $5 \times \boxed{n} = 400$
[J] $5 \times \boxed{n} = 450$
[K] $\boxed{n} \times 7 = 210$
[L] $\boxed{n} \times 6 = 300$
[M] $3 \times \boxed{n} = 270$
[N] $3 \times \boxed{n} = 120$
[O] $\boxed{n} \times 8 = 560$
[P] $\boxed{n} \times 6 = 480$
[Q] $\boxed{n} \times 6 = 180$
[R] $3 \times \boxed{n} = 150$

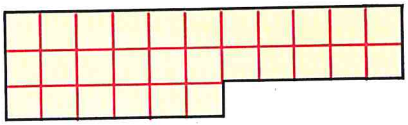
3. There are no whole number answers for 3 of these exercises. List these. Then find the differences in the other exercises.

[A] $\begin{array}{r} 65 \\ -23 \\ \hline \end{array}$
[B] $\begin{array}{r} 49 \\ -26 \\ \hline \end{array}$
[C] $\begin{array}{r} 31 \\ -42 \\ \hline \end{array}$
[D] $\begin{array}{r} 548 \\ -234 \\ \hline \end{array}$
[E] $\begin{array}{r} 156 \\ -133 \\ \hline \end{array}$

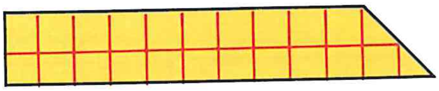
[F] $\begin{array}{r} 657 \\ -756 \\ \hline \end{array}$
[G] $\begin{array}{r} 329 \\ -216 \\ \hline \end{array}$
[H] $\begin{array}{r} 254 \\ -237 \\ \hline \end{array}$
[I] $\begin{array}{r} 472 \\ -481 \\ \hline \end{array}$
[J] $\begin{array}{r} 355 \\ -167 \\ \hline \end{array}$

4. Find the area of each region. The unit is □.

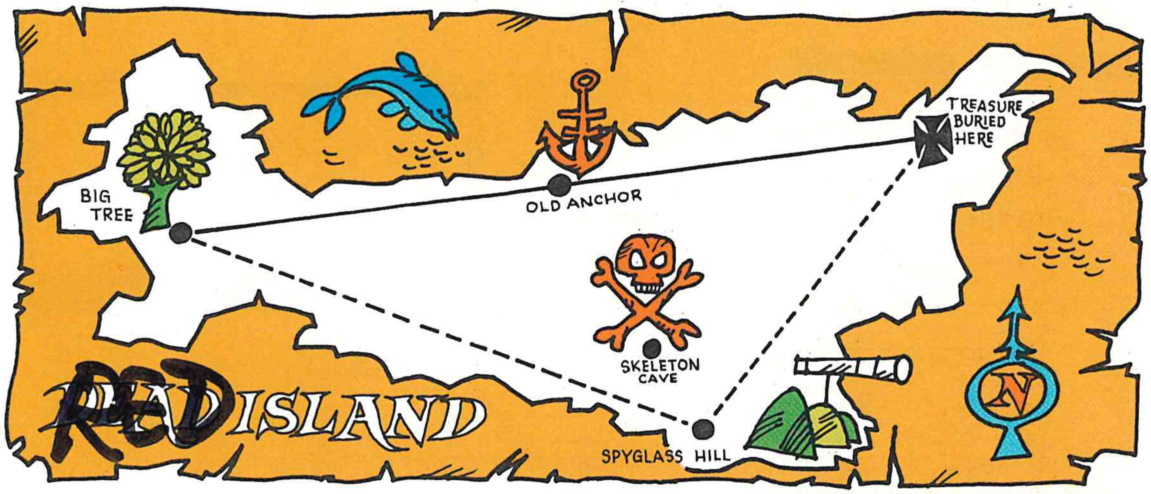
[A]



[B]



TREASURE MAP



John found this map in an old trunk in his attic. One piece of paper in the trunk where the map was found looked like this. →

Scale A: 1 inch

Each inch on the map means 1 mile on the island.

Use scale A to answer these questions.

1. How many miles is it from Big Tree to Spyglass Hill?
2. How many miles is it from Spyglass Hill to the treasure?

There was another scrap of paper in the trunk. Use scale B to answer the rest of the questions.

Scale B: 1 inch

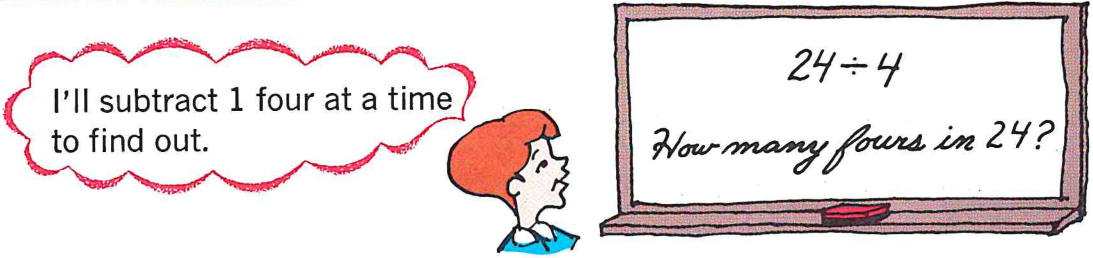
Each inch on the map means 2 miles on the island.

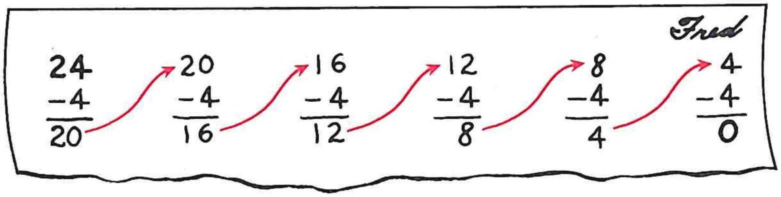
3. How many miles is it from Big Tree to Spyglass Hill?
4. How many miles is it from Spyglass Hill to the treasure?
5. How many miles would you walk if you went from Big Tree to Spyglass Hill and then to the treasure?
6. How many miles is it from Big Tree straight to the treasure?
7. How many miles is it from Old Anchor straight to Skeleton Cave?
8. How far is it from Skeleton Cave to Spyglass Hill?
9. Which is farther from Big Tree, Spyglass Hill or the treasure? How much farther?

Subtracting to find quotients

DISCUSSION EXERCISES

1.


I'll subtract 1 four at a time to find out.
24÷4
How many fours in 24?

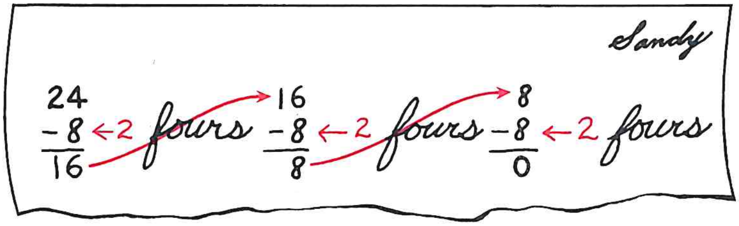


$24 - 4 = 20$ → $20 - 4 = 16$ → $16 - 4 = 12$ → $12 - 4 = 8$ → $8 - 4 = 4$ → $4 - 4 = 0$

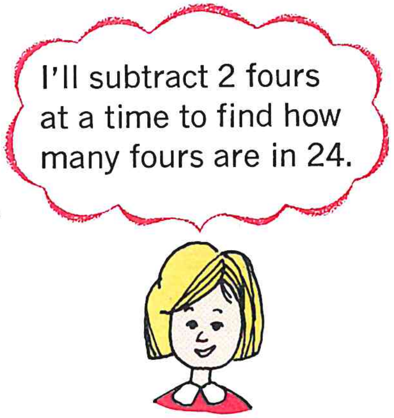
[A] How many fours did Fred find in 24?

[B] Solve: $24 \div 4 = \boxed{n}$

2.



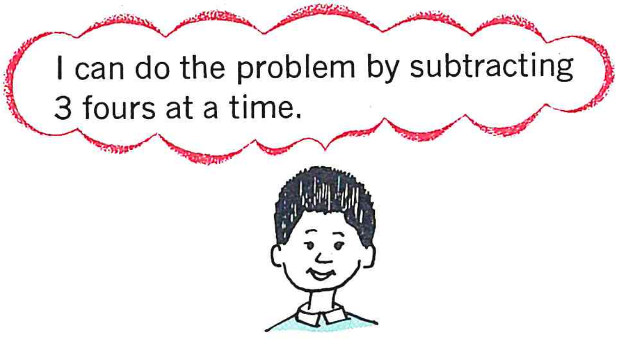
$24 - 8 = 16$ ← 2 fours → $16 - 8 = 8$ ← 2 fours → $8 - 8 = 0$ ← 2 fours

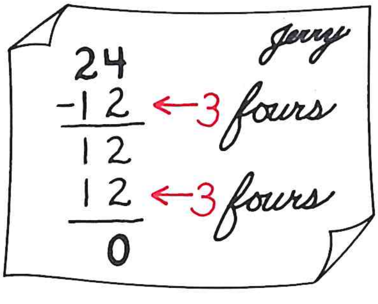

I'll subtract 2 fours at a time to find how many fours are in 24.

[A] How many fours did Sandy find in 24?

[B] Whose method is shorter?

3.


I can do the problem by subtracting 3 fours at a time.



$24 - 12 = 12$ ← 3 fours

$12 - 12 = 0$ ← 3 fours

[A] How many fours did Jerry find in 24?

[B] Explain two ways Jerry's method is shorter than the others.

EXERCISES

1. Find the differences. Then solve the division equation.

[A] $\begin{array}{r}25\\-5\\\hline\end{array}$ $\begin{array}{r}20\\-5\\\hline\end{array}$ $\begin{array}{r}15\\-5\\\hline\end{array}$ $\begin{array}{r}10\\-5\\\hline\end{array}$ $\begin{array}{r}5\\-5\\\hline\end{array}$ $25 \div 5 = \boxed{n}$

[B] $\begin{array}{r}18\\-3\\\hline\end{array}$ $\begin{array}{r}15\\-3\\\hline\end{array}$ $\begin{array}{r}12\\-3\\\hline\end{array}$ $\begin{array}{r}9\\-3\\\hline\end{array}$ $\begin{array}{r}6\\-3\\\hline\end{array}$ $\begin{array}{r}3\\-3\\\hline\end{array}$ $18 \div 3 = \boxed{n}$

[C] $\begin{array}{r}14\\-2\\\hline\end{array}$ $\begin{array}{r}12\\-2\\\hline\end{array}$ $\begin{array}{r}10\\-2\\\hline\end{array}$ $\begin{array}{r}8\\-2\\\hline\end{array}$ $\begin{array}{r}6\\-2\\\hline\end{array}$ $\begin{array}{r}4\\-2\\\hline\end{array}$ $\begin{array}{r}2\\-2\\\hline\end{array}$ $14 \div 2 = \boxed{n}$

2. Find the differences. Then solve the division equation.

[A] $\begin{array}{r}21\\-7\\\hline\square\\-7\\\hline\square\\-7\\\hline\square\end{array}$

$21 \div 7 = \boxed{n}$

[B] $\begin{array}{r}16\\-8\\\hline\square\\-8\\\hline\square\end{array}$

$16 \div 8 = \boxed{n}$

[C] $\begin{array}{r}27\\-9\\\hline\square\\-9\\\hline\square\\-9\\\hline\square\end{array}$

$27 \div 9 = \boxed{n}$

3. Find the differences. Then solve the division equations.

[A] $\begin{array}{rl}48&\\-16&\leftarrow 2\text{ eights}\\\hline\square&\\-16&\leftarrow 2\text{ eights}\\\hline\square&\\-16&\leftarrow 2\text{ eights}\\\hline\square&\end{array}$

$48 \div 8 = \boxed{n}$

[B] $\begin{array}{rl}35&\\-14&\leftarrow 2\text{ sevens}\\\hline\square&\\-14&\leftarrow 2\text{ sevens}\\\hline\square&\\-7&\leftarrow 1\text{ seven}\\\hline\square&\end{array}$

$35 \div 7 = \boxed{n}$

[C] $\begin{array}{rl}30&\\-18&\leftarrow 3\text{ sixes}\\\hline\square&\\-12&\leftarrow 2\text{ sixes}\\\hline\square&\end{array}$

$30 \div 6 = \boxed{n}$

Finding quotients

Find each quotient. Explain your answer.

A How many twos in 34? **$34 \div 2$**	**B** How many threes in 48? **$48 \div 3$**	**C** How many fours in 60? **$60 \div 4$**
$\begin{array}{r l} \mathbf{34} & \\ -20 & \leftarrow 10 \text{ twos} \\ \cline{1-1} 14 & \\ -14 & \leftarrow 7 \text{ twos} \\ \cline{1-1} 0 & \end{array}$ $34 \div 2 = n$	$\begin{array}{r l} \mathbf{48} & \\ -30 & \leftarrow 10 \text{ threes} \\ \cline{1-1} 18 & \\ -18 & \leftarrow 6 \text{ threes} \\ \cline{1-1} 0 & \end{array}$ $48 \div 3 = n$	$\begin{array}{r l} \mathbf{60} & \\ -40 & \leftarrow 10 \text{ fours} \\ \cline{1-1} 20 & \\ -20 & \leftarrow 5 \text{ fours} \\ \cline{1-1} 0 & \end{array}$ $60 \div 4 = n$

EXERCISES

1. Find the quotients. The subtractions should help.

[A] $36 \div 3 = n$

$$\begin{array}{r l} \mathbf{36} & \\ -30 & \leftarrow 10 \text{ threes} \\ \cline{1-1} 6 & \\ -6 & \leftarrow 2 \text{ threes} \\ \cline{1-1} 0 & \end{array}$$

[B] $52 \div 4 = n$

$$\begin{array}{r l} \mathbf{52} & \\ -40 & \leftarrow 10 \text{ fours} \\ \cline{1-1} 12 & \\ -12 & \leftarrow 3 \text{ fours} \\ \cline{1-1} 0 & \end{array}$$

[C] $84 \div 6 = n$

$$\begin{array}{r l} \mathbf{84} & \\ -60 & \leftarrow 10 \text{ sixes} \\ \cline{1-1} 24 & \\ -24 & \leftarrow 4 \text{ sixes} \\ \cline{1-1} 0 & \end{array}$$

[D] $65 \div 5 = n$

$$\begin{array}{r l} \mathbf{65} & \\ -50 & \leftarrow 10 \text{ fives} \\ \cline{1-1} 15 & \\ -15 & \leftarrow 3 \text{ fives} \\ \cline{1-1} 0 & \end{array}$$

[E] $90 \div 6 = n$

$$\begin{array}{r l} \mathbf{90} & \\ -60 & \leftarrow 10 \text{ sixes} \\ \cline{1-1} 30 & \\ -30 & \leftarrow 5 \text{ sixes} \\ \cline{1-1} 0 & \end{array}$$

[F] $78 \div 6 = n$

$$\begin{array}{r l} \mathbf{78} & \\ -60 & \leftarrow 10 \text{ sixes} \\ \cline{1-1} 18 & \\ -18 & \leftarrow 3 \text{ sixes} \\ \cline{1-1} 0 & \end{array}$$

2. Find the differences. Then find each quotient.

[A] 46 ÷ 2 = n

46
−20 ← 10 twos
▨
−20 ← 10 twos
▨
−6 ← 3 twos
▨

[B] 75 ÷ 3 = n

75
−30 ← 10 threes
▨
−30 ← 10 threes
▨
−15 ← 5 threes
▨

[C] 126 ÷ 6 = n

126
−60 ← 10 sixes
▨
−60 ← 10 sixes
▨
−6 ← 1 six
▨

3. Find the quotients. The subtractions should help.

[A] 92 ÷ 4 = n

92
−80 ← 20 fours
12
−12 ← 3 fours
0

[B] 68 ÷ 2 = n

68
−60 ← 30 twos
8
−8 ← 4 twos
0

[C] 75 ÷ 3 = n

75
−60 ← 20 threes
15
−15 ← 5 threes
0

4. Find the quotients. The subtractions should help.

[A] 78 ÷ 2

78
−60
18
−18
0

[B] 93 ÷ 3

93
−90
3
−3
0

[C] 115 ÷ 5

115
−100
15
−15
0

[D] 148 ÷ 4

148
−120
28
−28
0

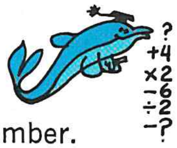
[E] 185 ÷ 5

185
−150
35
−35
0

[F] 177 ÷ 3

177
−150
27
−27
0

Think

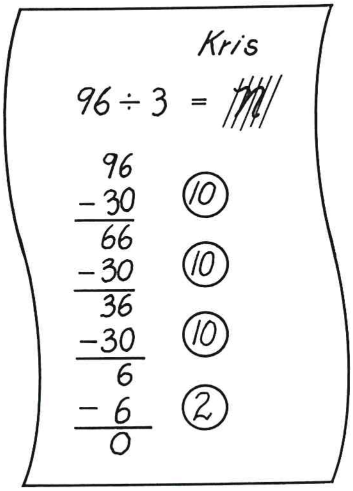


1. Pick a number.
2. Add 4.
3. Multiply by 2.
4. Subtract 6.
5. Divide by 2.
6. Subtract the number you started with.

Do you think you will always end with 1?
Try this several times.

Finding quotients by subtraction

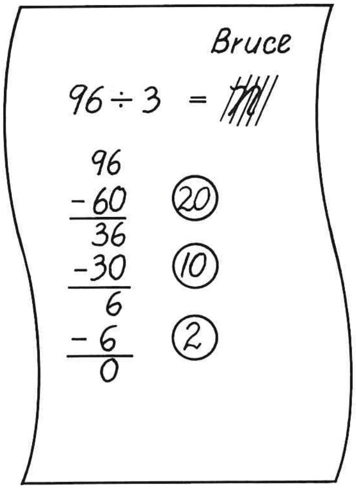
The papers below show how three third-grade children found the quotient 96 ÷ 3. The numbers in the ring tell how many threes were subtracted each time.



Kris

96 ÷ 3 =

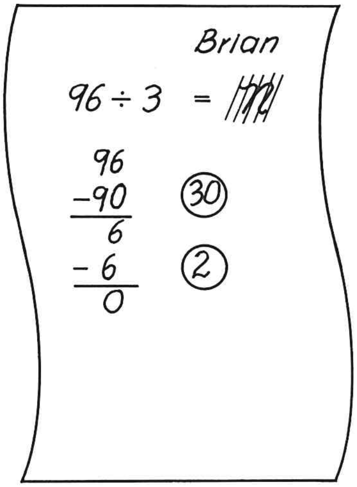
96
− 30 ⑩
66
− 30 ⑩
36
− 30 ⑩
6
− 6 ②
0



Bruce

96 ÷ 3 =

96
− 60 ⑳
36
− 30 ⑩
6
− 6 ②
0



Brian

96 ÷ 3 =

96
− 90 ㉚
6
− 6 ②
0

DISCUSSION EXERCISES

1. Explain the steps Kris used to find the quotient.
2. In what way is Bruce's work shorter?
3. How does Brian's work differ from Bruce's?
4. Do all the children get the same quotient?

EXERCISES

1. Find the quotients. The numbers in the ring tell how many sixes were subtracted each time.

[A] 156 ÷ 6 = n

156
−60 ⑩
96
−60 ⑩
36
−36 ⑥
0

[B] 204 ÷ 6 = n

204
−120 ⑳
84
−60 ⑩
24
−24 ④
0

[C] 252 ÷ 6 = n

252
−120 ⑳
132
−120 ⑳
12
−12 ②
0

2. Copy each exercise. Give the number of twos for each ring. Then give the quotient.

[A] $48 \div 2 = \boxed{n}$

$$\begin{array}{rl} 48 & \\ -20 & \bigcirc \\ \hline 28 & \\ -20 & \bigcirc \\ \hline 8 & \\ -8 & \bigcirc \\ \hline 0 & \end{array}$$

[B] $62 \div 2 = \boxed{n}$

$$\begin{array}{rl} 62 & \\ -40 & \bigcirc \\ \hline 22 & \\ -20 & \bigcirc \\ \hline 2 & \\ -2 & \bigcirc \\ \hline 0 & \end{array}$$

[C] $92 \div 2 = \boxed{n}$

$$\begin{array}{rl} 92 & \\ -40 & \bigcirc \\ \hline 52 & \\ -40 & \bigcirc \\ \hline 12 & \\ -12 & \bigcirc \\ \hline 0 & \end{array}$$

3. Copy each exercise. Give the number of fours for each ring. Then give the quotient.

[A] $128 \div 4 = \boxed{n}$

$$\begin{array}{rl} 128 & \\ -80 & \bigcirc \\ \hline 48 & \\ -40 & \bigcirc \\ \hline 8 & \\ -8 & \bigcirc \\ \hline 0 & \end{array}$$

[B] $104 \div 4 = \boxed{n}$

$$\begin{array}{rl} 104 & \\ -40 & \bigcirc \\ \hline 64 & \\ -40 & \bigcirc \\ \hline 24 & \\ -24 & \bigcirc \\ \hline 0 & \end{array}$$

[C] $172 \div 4 = \boxed{n}$

$$\begin{array}{rl} 172 & \\ -80 & \bigcirc \\ \hline 92 & \\ -80 & \bigcirc \\ \hline 12 & \\ -12 & \bigcirc \\ \hline 0 & \end{array}$$

4. Use subtraction as in exercises 1, 2, and 3 to help you find these quotients.

[A] $46 \div 2$

[B] $115 \div 5$

[C] $155 \div 5$

[D] $132 \div 4$

[E] $138 \div 3$

[F] $126 \div 6$

[G] $224 \div 7$

[H] $106 \div 2$

[I] $152 \div 4$

[J] $336 \div 8$

Think

Study the first four equations. Then solve the last one.

$$(1 \times 9) + 2 = 11$$
$$(12 \times 9) + 3 = 111$$
$$(123 \times 9) + 4 = 1111$$
$$(1234 \times 9) + 5 = 11{,}111$$
$$(12{,}345 \times 9) + 6 = \boxed{n}$$

Short stories

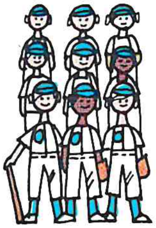
1. 300 baseball cards.
5 on each page.
How many pages?

2. 320 airplane cards.
4 cards on each page.
How many pages?

3. 96 marching-band players.
8 rows. Same number in each row. How many in each row?

4. To the zoo in buses.
210 children.
7 buses.
Same number in each bus.
How many children in each bus?

5. 90 bottles of soda.
6 in each carton.
How many cartons?



6. 108 boys.
9 boys on each team.
How many teams?

7. Square dancing. 112 girls.
8 girls make a "square."
How many squares?

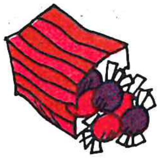
8. 192 trading stamps.
8 pages.
Same number on each page. How many stamps on each page?

9. 240 doll-picture cards.
6 on each page.
How many pages?

10. 184 tickets. 8 bundles of the same size.
How many in each bundle?

11. 248 trading stamps.
8 stamps in a row.
How many rows?

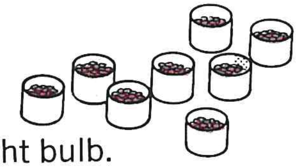
12. 450 miles in 9 hours. Same number of miles each hour.
How many miles each hour?



13. 216 pieces of candy.
6 pieces in each bag.
How many bags?

14. Use 8 gallons of gasoline to go 320 miles.
How many miles traveled on each gallon?

15. 168 pennies.
Same number in each of 8 cans.
How many in each can?



16. Light bulb.
Blinks 9 times each minute.
378 blinks. How many minutes have passed?

At the scout camp

1. 8 Girl Scouts slept in each cabin. How many cabins were used by the 56 girls from Pine City?

2. 54 Boy Scouts went to Camp Eagle in 6 station wagons. There were the same number of scouts in each station wagon. How many went in each station wagon?

3. There were 270 Girl Scouts at Camp Sunrise. There were 9 troops of the same size. How many were in each troop?

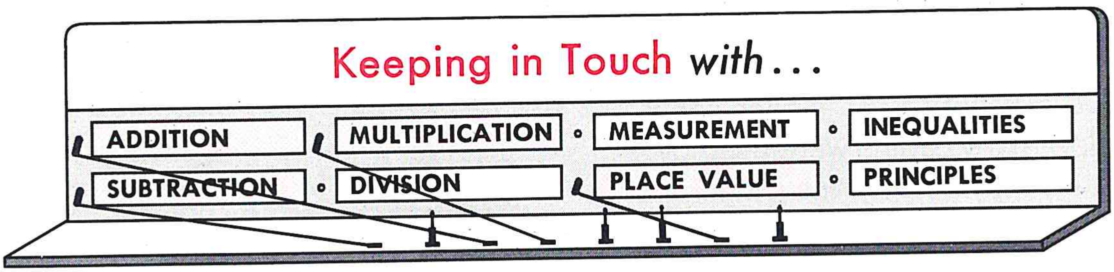
4. One week 208 scouts came to Camp Eagle. They lived in tents. 4 scouts slept in each tent. How many tents were used?

5. 200 Girl Scouts ate meals in a large cabin. 8 girls sat at each table. How many tables were there?

6. 72 scouts planned to take a boating trip from Camp Eagle to Camp Sunrise. If each boat could hold 6 scouts, how many boats were needed?

7. On July 4, a scoutmaster at Camp Eagle bought a bottle of soda for each scout. There were 540 Boy and Girl Scouts at the campfire party. How many cartons of 6 bottles did he buy?

3. During the summer 288 scouts visited an Indian museum. The guide took the scouts through the museum in groups of 9. How many trips did he make in all?



1. Find the sums and differences.

[A] $\begin{array}{r}124\\-67\\\hline\end{array}$ [B] $\begin{array}{r}103\\+45\\\hline\end{array}$ [C] $\begin{array}{r}111\\-64\\\hline\end{array}$ [D] $\begin{array}{r}158\\+78\\\hline\end{array}$ [E] $\begin{array}{r}170\\-83\\\hline\end{array}$

[F] $\begin{array}{r}104\\-66\\\hline\end{array}$ [G] $\begin{array}{r}100\\-72\\\hline\end{array}$ [H] $\begin{array}{r}156\\-56\\\hline\end{array}$ [I] $\begin{array}{r}163\\-74\\\hline\end{array}$ [J] $\begin{array}{r}784\\-90\\\hline\end{array}$

2. Find the products.

[A] $\begin{array}{r}34\\\times 2\\\hline\end{array}$ [B] $\begin{array}{r}26\\\times 3\\\hline\end{array}$ [C] $\begin{array}{r}42\\\times 4\\\hline\end{array}$ [D] $\begin{array}{r}37\\\times 5\\\hline\end{array}$ [E] $\begin{array}{r}73\\\times 6\\\hline\end{array}$

[F] $\begin{array}{r}68\\\times 5\\\hline\end{array}$ [G] $\begin{array}{r}59\\\times 6\\\hline\end{array}$ [H] $\begin{array}{r}74\\\times 7\\\hline\end{array}$ [I] $\begin{array}{r}83\\\times 8\\\hline\end{array}$ [J] $\begin{array}{r}92\\\times 9\\\hline\end{array}$

3. Answer "more than 100" or "less than 100" for each product.

[A] 3 × 33
[B] 3 × 34
[C] 4 × 22
[D] 4 × 33
[E] 5 × 21
[F] 5 × 19
[G] 6 × 20
[H] 10 × 9
[I] 10 × 11
[J] 11 × 11
[K] 9 × 11
[L] 9 × 12

4. Find the sums.

[A] $\begin{array}{r}15\\32\\40\\\hline\end{array}$ [B] $\begin{array}{r}62\\24\\46\\\hline\end{array}$ [C] $\begin{array}{r}74\\37\\53\\\hline\end{array}$

★ **5.** Find the missing digits.

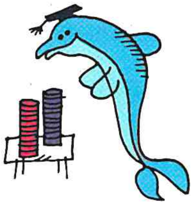
[A] $\begin{array}{r}\square 5\\+4\square\\\hline 81\end{array}$ [B] $\begin{array}{r}\square 8\\+3\square\\\hline 112\end{array}$

[C] $\begin{array}{r}6\square\\-\square 8\\\hline 39\end{array}$ [D] $\begin{array}{r}\square 4\\-1\square\\\hline 38\end{array}$

[E] $\begin{array}{r}\square 6\\\times 2\\\hline 92\end{array}$ [F] $\begin{array}{r}3\square\\\times 4\\\hline 148\end{array}$

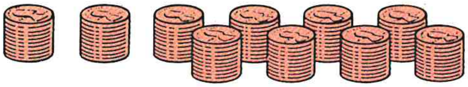
Think

There were two stacks of checkers on the table. 6 checkers were removed from one stack and placed on the other. Then the stacks had the same number of checkers. Before moving the 6 checkers, how many more did the taller stack have than the shorter one?



MONEY PROBLEMS

1 dollar
is worth
100 pennies.



1. Give the missing numbers.

Examples:

$3.47 means 3 dollars and 47 cents.

$3.47 means 347 cents.

[A] $5.39 means ▥ dollars and ▥ cents.

[B] $3.86 means ▥ dollars and ▥ cents.

[C] $4.23 means 3 dollars and ▥ cents.

[D] $7.33 means ▥ cents.

[E] $5.37 means 4 dollars and ▥ cents.

2. Find the total amounts.

Example: $1.34 and $3.23 is $4.57

[A] $3.32 and $2.45

[B] $12.57 and $8.32

[C] $3.64 and $4.58

[D] $8.64 and $1.36

[E] $$\begin{array}{r} \$\ 7.32 \\ 12.68 \\ \hline \end{array}$$

3. Find the difference in the amounts.

Example:

$$\begin{array}{r} \$4.65 \\ 3.13 \\ \hline \$1.52 \end{array}$$

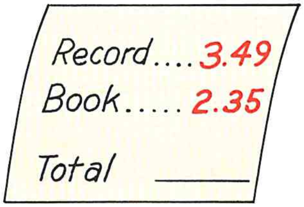
[A] $$\begin{array}{r} \$5.86 \\ 2.42 \\ \hline \end{array}$$

[B] $$\begin{array}{r} \$9.47 \\ 2.13 \\ \hline \end{array}$$

[C] $$\begin{array}{r} \$8.52 \\ 3.36 \\ \hline \end{array}$$

[D] $$\begin{array}{r} \$4.38 \\ 2.53 \\ \hline \end{array}$$

4. [A] Susan bought a record and a book. The clerk wrote the costs down like this. Find the total amount.

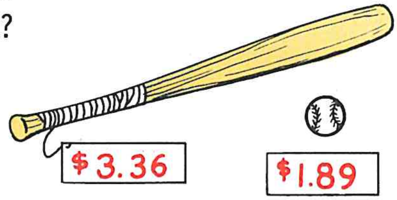


Record.... 3.49
Book..... 2.35
Total ______

[B] Susan gave the clerk 6 dollars. How much change did she get?

[C] Susan had $8.67 when she left home. She spent $6.34. How much did she have left?

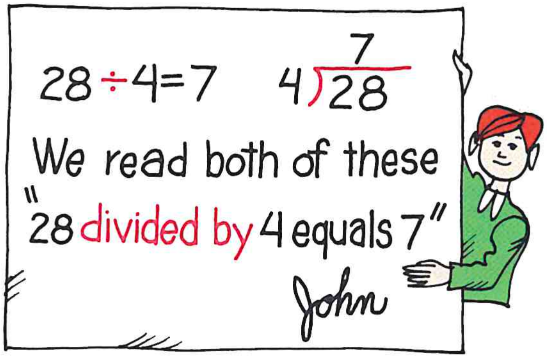
5. Ken bought a baseball and a bat. Find the total cost.



6. Bob went to a store where the same ball and bat cost a total of $4.89. How much more did Ken's ball and bat cost than Bob's?

A new way to write division exercises

John made a poster to show a new way to write division exercises.



$28 \div 4 = 7$ $\quad \begin{array}{r}7\\4\overline{)28}\end{array}$

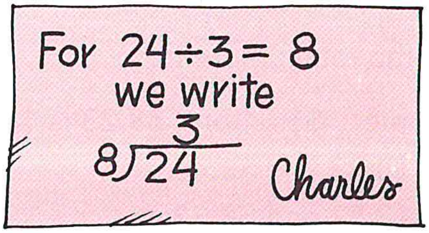
We read both of these

"28 divided by 4 equals 7"

John

DISCUSSION EXERCISES

1. Show how to write the following division equation using the new way: $45 \div 5 = 9$



For $24 \div 3 = 8$

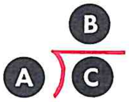
we write

$\begin{array}{r}3\\8\overline{)24}\end{array}$

Charles

2. Explain what Charles did wrong on his paper.

3. Which letter—A, B, or C—represents the quotient?



EXERCISES

1. Write each of these exercises using the new method.

[A] $12 \div 4 = 3$ [B] $14 \div 2 = 7$ [C] $48 \div 6 = 8$ [D] $56 \div 9 = 7$

2. Find the quotients.

[A] $2\overline{)6}$ [B] $2\overline{)14}$ [C] $8\overline{)24}$ [D] $8\overline{)40}$ [E] $8\overline{)56}$

[F] $5\overline{)25}$ [G] $4\overline{)16}$ [H] $4\overline{)32}$ [I] $6\overline{)36}$ [J] $7\overline{)56}$

[K] $3\overline{)15}$ [L] $3\overline{)21}$ [M] $7\overline{)28}$ [N] $8\overline{)24}$ [O] $6\overline{)48}$

[P] $2\overline{)60}$ [Q] $2\overline{)140}$ [R] $6\overline{)240}$ [S] $8\overline{)400}$ [T] $4\overline{)360}$

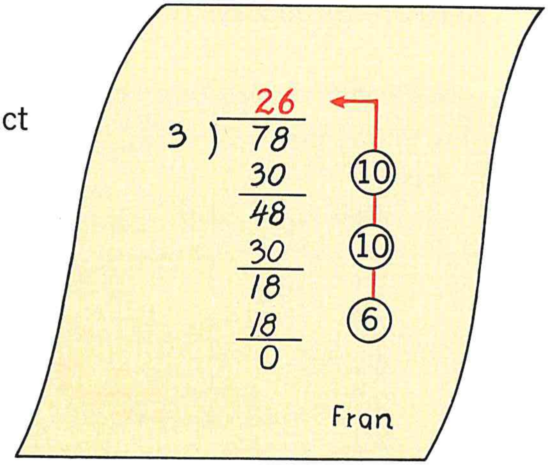
DISCUSSION EXERCISES

1. Fran found how many threes there are in ||||||.

2. [A] How many threes did Fran subtract the first time?
   [B] How many the second time?
   [C] The third time?

3. What numbers did Fran add to find the quotient?

4. What is the quotient?



$$\begin{array}{r l}
26 & \leftarrow \\
3\overline{)\,78} & \\
\underline{30} & \text{⑩} \\
48 & \\
\underline{30} & \text{⑩} \\
18 & \\
\underline{18} & \text{⑥} \\
0 &
\end{array}$$

Fran

EXERCISES

1. Find the quotients.

[A]
$$\begin{array}{r l}
\text{||||||} & \leftarrow \\
2\overline{)46} & \\
\underline{20} & \text{⑩} \\
26 & \\
\underline{20} & \text{⑩} \\
6 & \\
\underline{6} & \text{③} \\
0 &
\end{array}$$

[B]
$$\begin{array}{r l}
\text{||||||} & \leftarrow \\
5\overline{)85} & \\
\underline{50} & \text{⑩} \\
35 & \\
\underline{35} & \text{⑦} \\
0 &
\end{array}$$

[C]
$$\begin{array}{r l}
\text{||||||} & \leftarrow \\
4\overline{)144} & \\
\underline{80} & \text{⑳} \\
64 & \\
\underline{40} & \text{⑩} \\
24 & \\
\underline{24} & \text{⑥} \\
0 &
\end{array}$$

[D]
$$\begin{array}{r l}
\text{||||||} & \leftarrow \\
3\overline{)114} & \\
\underline{90} & \text{㉚} \\
24 & \\
\underline{24} & \text{⑧} \\
0 &
\end{array}$$

2. Copy each exercise and give the missing numbers.

[A]
$$\begin{array}{r l}
\text{||||||} & \\
3\overline{)42} & \\
\underline{30} & \bigcirc \\
12 & \\
\underline{12} & \bigcirc \\
0 &
\end{array}$$

[B]
$$\begin{array}{r l}
\text{||||||} & \\
6\overline{)78} & \\
\underline{60} & \bigcirc \\
18 & \\
\underline{18} & \bigcirc \\
0 &
\end{array}$$

[C]
$$\begin{array}{r l}
\text{||||||} & \\
4\overline{)92} & \\
\underline{80} & \bigcirc \\
12 & \\
\underline{12} & \bigcirc \\
0 &
\end{array}$$

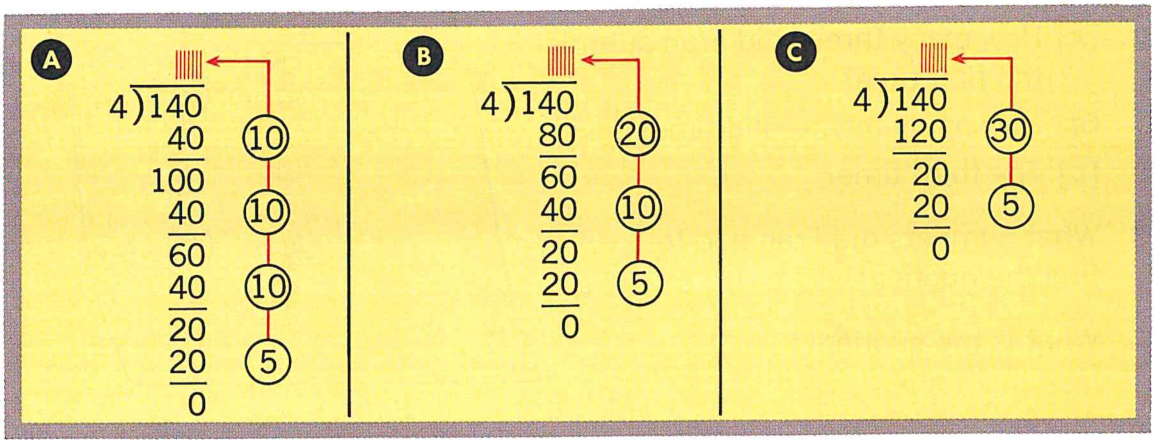
[D]
$$\begin{array}{r l}
\text{||||||} & \\
7\overline{)105} & \\
\underline{70} & \bigcirc \\
35 & \\
\underline{35} & \bigcirc \\
0 &
\end{array}$$

. Find the quotients.

[A] $2\overline{)34}$ [B] $5\overline{)65}$ [C] $3\overline{)48}$ [D] $6\overline{)72}$ [E] $4\overline{)96}$ [F] $7\overline{)84}$

Practice finding quotients

Here are three ways to find the quotient for 140 ÷ 4.



DISCUSSION EXERCISES

1. In each case the quotient is ▯.
2. Explain the steps in each example.
3. Which method do you think is easiest?
4. Which do you think is shortest?

EXERCISES

1. Find the quotients.

[A] $6\overline{)126}$ [E] $4\overline{)132}$ [I] $3\overline{)135}$

[B] $3\overline{)102}$ [F] $7\overline{)154}$ [J] $6\overline{)222}$

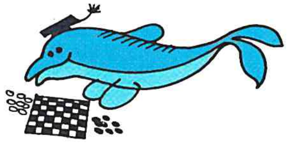
[C] $5\overline{)175}$ [G] $4\overline{)224}$ [K] $8\overline{)344}$

[D] $7\overline{)168}$ [H] $5\overline{)160}$ [L] $5\overline{)325}$

★ 2. Find the quotients.

[A] $23\overline{)276}$ [B] $34\overline{)374}$ [C] $22\overline{)528}$

Think



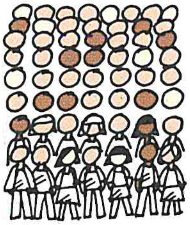
There were three stacks of checkers on the table. 6 checkers were removed from one stack and divided equally between the other two stacks. Then all stacks had the same number. At the beginning, how many more checkers were in the tall stack than in the shorter ones?

Short stories

1. 78 children.
9 more came later.
How many children in all?

2. 162 children.
Same number of children
in each of 6 groups.
How many in each group?

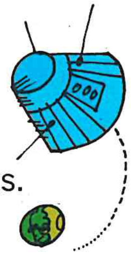
3. 82 children.
37 boys.
How many girls?



4. 62 girls.
54 boys.
How many more girls than boys?

5. 315 chairs.
7 rows.
Same number in each row.
How many in each row?

6. 6 bushels.
48 pounds per bushel.
How many pounds in all?



7. Satellite makes 558 orbits.
9 orbits each day.
How many days?

8. 184 chairs.
8 in each row.
How many rows?

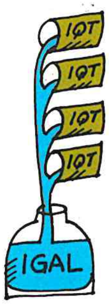
9. 108 eggs. 9 cartons.
Same number in each carton.
How many in each carton?

10. 7 days in a week.
364 days.
How many weeks?

11. 112 ounces are 7 pounds.
How many ounces in 1 pound?

12. 5280 feet in a mile.
How many feet in 2 miles?

13. 87 cents for 3 pints
of ice cream.
How much per pint?

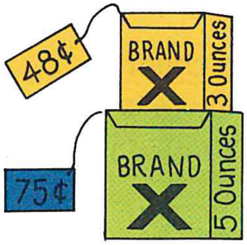


14. 4 quarts in a gallon.
96 cents per gallon.
How much per quart?

★ 15. 2 pints in a quart.
4 quarts in a gallon.
$1.92 (192 cents) per gallon.
How much per pint?

Comparing prices

1. A small box of Brand X holds 3 ounces and sells for 48 cents. A large box of Brand X holds 5 ounces and sells for 75 cents.

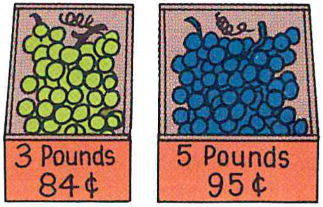


[A] What is the cost per ounce in the small box?
[B] What is the cost per ounce in the large box?
[C] Which is the better buy?

2. A 4-pound beef roast costs $3.56 (356 cents). A 5-pound ham costs $3.95 (395 cents).

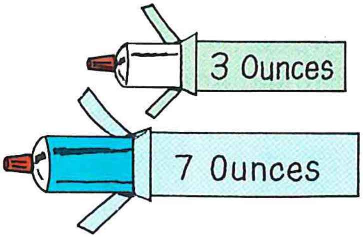
[A] How much is the beef per pound?
[B] How much is the ham per pound?
[C] Which meat is more expensive?

3. White grapes are 3 pounds for 84 cents and red grapes are 5 pounds for 95 cents.



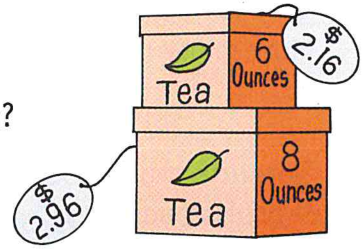
[A] How much are the white grapes per pound?
[B] How much are the red grapes per pound?
[C] Which grapes are less expensive?

4. A 7-ounce tube of toothpaste costs 84 cents. A 3-ounce tube of toothpaste costs 54 cents.



[A] In the large tube, how much is the toothpaste per ounce?
[B] In the small tube, how much is the toothpaste per ounce?
[C] Which is the better buy?

5. A 6-ounce can of tea costs $2.16 (216 cents). An 8-ounce can of tea costs $2.96 (296 cents).



[A] How much per ounce is the tea in the small can?
[B] How much per ounce is the tea in the large can?
[C] Which is more expensive?

Short stories: time

1. 4 o'clock now. Sleep for 7 hours. What time will it be?

2. Walk a mile in 23 minutes. Run a mile in 9 minutes. How much quicker to run?

3. 60 minutes in 1 hour. 8 hours. How many minutes?

4. Machine runs 424 minutes a day. Makes one thing each 8 minutes. How many things?

5. 1 day has 24 hours. 9 days. How many hours?

6. 126 days make 9 fortnights. 1 fortnight is how many days?

7. Total sleep, 736 hours. 8 hours each day. How many days?

8. 658 days. How many weeks?

9. Turbojet goes 577 mph (miles per hour). Gas-engine plane goes 334 mph. How much faster is the turbojet?

0. 420 seconds. Same as 7 minutes. How many seconds in a minute?

Animals, trees, birds, and insects grow old. Exercises 11 through 18 tell how old they sometimes grow.

11. An old cat: 15 years old. An old turtle: 10 times as old. How old is an old turtle?

12. An old rabbit: 6 years old. An old goose: 11 times as old. How old is an old goose?

13. An old bear: 35 years old. An old camel: 28 years old. How much older is an old bear than an old camel?

14. An old reindeer: 12 years old. An old whale: 6 times as old. How old is an old whale?

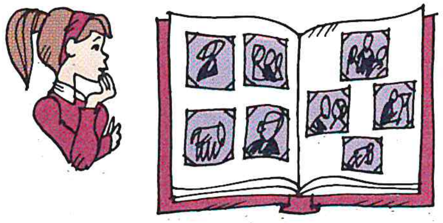
15. Spruce tree: 243 years old. Lives 339 more years. How old?

16. An old eagle: 46 years old. An old elm tree: 7 times as old. How old is an old elm tree?

17. An old elephant: 61 years old. An old cow: 24 years old. How much older is an old elephant than an old cow?

18. An old butterfly: 8 weeks old. An old housefly: 6 weeks old. How many **days** older is the old butterfly?

Remainders in division



Sara had 51 photographs to put into her new photo book. She could put 4 pictures on a page. She decided to use division to find how many pages she would need.

$$\begin{array}{rrl}
\text{quotient} \rightarrow & 12 & \\
4 & \overline{)\,51} & \\
\text{divisor} \nearrow & \underline{40} & \textcircled{10} \\
 & 11 & \\
 & \underline{8} & \textcircled{2} \\
 & 3 & \leftarrow \text{remainder}
\end{array}$$

DISCUSSION EXERCISES

1. When Sara divided 51 by 4, what did she get for the quotient?

2. After Sara used 12 pages of the book, how many photos would she have left?

3. Notice that 3 is called the **remainder** and 4 the **divisor.**

[A] If 4 is the divisor, could you have a remainder of 4? Explain.
[B] Could you have a remainder greater than the divisor?

▶ In dividing, we agree to carry out the division process until the remainder is less than the divisor.

4. In the exercise at the right,

[A] which number is the quotient?
[B] which number is the divisor?
[C] which number is the remainder?

$$\begin{array}{rrl}
 & 8 & \\
3 & \overline{)\,25} & \\
 & \underline{24} & \textcircled{8} \\
 & 1 &
\end{array}$$

5. Complete each sentence.

[A] If we divide a number by 3, the remainder is less than ▥.
[B] If we divide a number by 6, the remainder is less than ▥.
[C] If we divide a number by 7, the remainder is less than ▥.

6. If we divide a number by 5, the possible remainders are 0, 1, 2, 3, and 4. List all the possible remainders if we divide by 9.

EXERCISES

1. Complete the sentences.

① $$\begin{array}{r} 6 \\ 4\overline{)26} \\ 24 \\ \hline 2 \end{array}$$

② $$\begin{array}{r} 3 \\ 7\overline{)25} \\ 21 \\ \hline 4 \end{array}$$

③ $$\begin{array}{r} 27 \\ 5\overline{)136} \\ 100 \\ \hline 36 \\ 35 \\ \hline 1 \end{array}$$

④ $$\begin{array}{r} 45 \\ 3\overline{)135} \\ 120 \\ \hline 15 \\ 15 \\ \hline 0 \end{array}$$

[A] In example 1, the quotient is ▥ and the remainder is ▥.
[B] In example 2, the _?_ is 3 and the _?_ is 4.
[C] In example 3, the _?_ is 5 and the _?_ is 27.
[D] In example 4, the remainder is ▥ and the quotient is ▥.
[E] In each example, the _?_ is less than the _?_.
[F] In any division, the _?_ is less than the _?_.

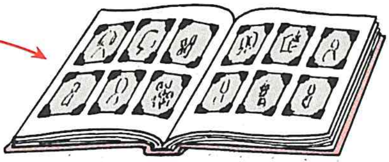
2. Find the quotients and remainders.

[A] $3\overline{)28}$ [B] $4\overline{)39}$ [C] $5\overline{)42}$ [D] $6\overline{)45}$ [E] $7\overline{)59}$

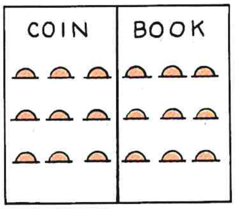
[F] $8\overline{)78}$ [G] $9\overline{)71}$ [H] $4\overline{)46}$ [I] $3\overline{)98}$ [J] $7\overline{)166}$

[K] $4\overline{)237}$ [L] $8\overline{)337}$ [M] $3\overline{)181}$ [N] $9\overline{)376}$ [O] $5\overline{)364}$

3. Susan had 57 pictures for her new album. She put 6 pictures on each page.
[A] How many full pages could she get?
[B] How many pictures would be left over for the last page?



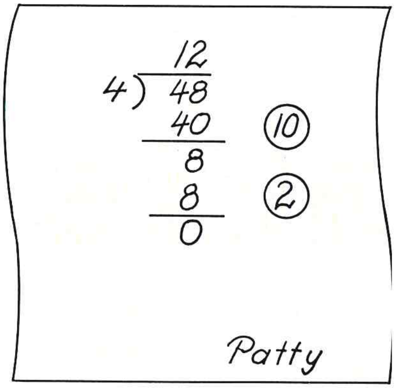
4. Jim has 221 Indian-head pennies. His coin book has room for 9 pennies on each page.
[A] How many full pages could he get?
[B] How many pennies would be left over for the last page?



5. When the remainder is zero, we check our quotient by multiplication. Can you explain how to check when the remainder is not zero?

Checking division

DISCUSSION EXERCISES

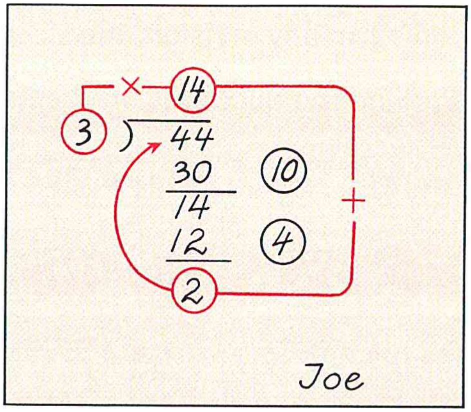


1. Explain how Patty can use multiplication to see if she has found the quotient for $48 \div 4$.

2. Use multiplication to find which of these equations are false.

[A] $36 \div 2 = 18$ [C] $76 \div 4 = 19$

[B] $54 \div 3 = 16$ [D] $124 \div 4 = 32$



3. Joe made this poster to explain how to check division when the remainder is not zero.

[A] What is the product of 3×14?

[B] Explain why you must **add** the remainder to this product to get 44.

[C] Explain how Joe's diagram shows a way you can check division.

EXERCISES

Find the quotients and remainders. Then check your answers.

1. $4\overline{)25}$ **2.** $5\overline{)27}$ **3.** $3\overline{)10}$ **4.** $6\overline{)39}$ **5.** $2\overline{)19}$

6. $5\overline{)37}$ **7.** $6\overline{)29}$ **8.** $7\overline{)65}$ **9.** $4\overline{)30}$ **10.** $3\overline{)29}$

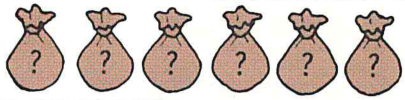
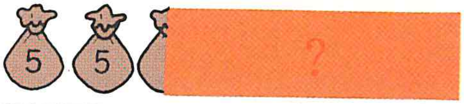
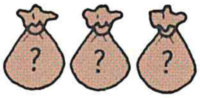
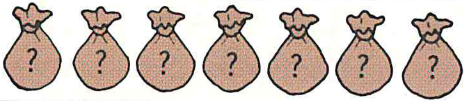
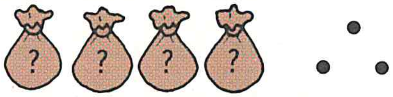
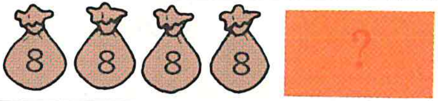
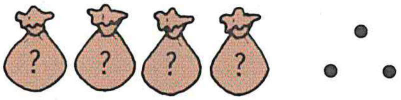
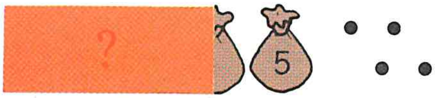
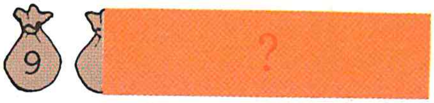
11. $8\overline{)206}$ **12.** $6\overline{)154}$ **13.** $5\overline{)276}$ **14.** $7\overline{)185}$ **15.** $6\overline{)134}$

16. $3\overline{)182}$ **17.** $9\overline{)526}$ **18.** $5\overline{)348}$ **19.** $4\overline{)242}$ **20.** $7\overline{)188}$

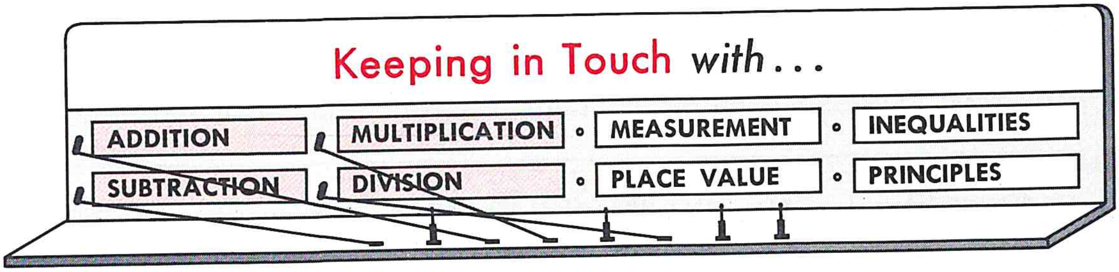
21. $6\overline{)308}$ **22.** $5\overline{)79}$ **23.** $3\overline{)84}$ **24.** $9\overline{)278}$ **25.** $4\overline{)342}$

Using division

In a given exercise, each bag contains the same number of marbles.

1.	42 marbles		How many in each bag?
2.	75 marbles		None left over. How many bags?
3.	57 marbles		3 bags. How many in each bag? How many left over?
4.	132 marbles		Less than 6 left over. How many bags? How many left over?
5.	161 marbles		How many in each bag?
6.	43 marbles		3 left over. How many in each bag?
7.	35 marbles		How many left over?
8.	39 marbles		4 left over. How many bags?
9.	27 marbles		3 left over. How many in each bag?
0.	44 marbles		4 left over. How many bags?
1.	60 marbles		Less than 9 left over. How many bags? How many left over?

Keeping in Touch *with . . .*



EXERCISES

1. Find the sums, products, quotients, or differences.

[A] $\begin{array}{r}94\\+39\\\hline\end{array}$ [B] $\begin{array}{r}68\\\times3\\\hline\end{array}$ [C] $\begin{array}{r}78\\-52\\\hline\end{array}$ [D] $\begin{array}{r}81\\+79\\\hline\end{array}$ [E] $\begin{array}{r}63\\\times5\\\hline\end{array}$ [F] $\begin{array}{r}79\\\times6\\\hline\end{array}$

[G] $\begin{array}{r}27\\+88\\\hline\end{array}$ [H] $\begin{array}{r}56\\\times8\\\hline\end{array}$ [I] $\begin{array}{r}65\\+99\\\hline\end{array}$ [J] $\begin{array}{r}93\\\times7\\\hline\end{array}$ [K] $\begin{array}{r}142\\-80\\\hline\end{array}$ [L] $\begin{array}{r}125\\-52\\\hline\end{array}$

[M] $65 - 23$ [N] $350 \div 7$ [O] $350 \div 5$ [P] $540 \div 9$ [Q] $120 \div 3$

2. Tell what operation (+, −, ×, ÷) you think of for:

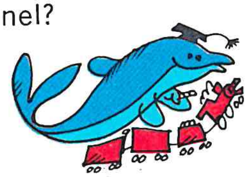
[A] putting 2 sets together and finding the total number.
[B] finding how many are left after some have been taken away.
[C] finding how many sets of a certain size we get from a set.
[D] how many in a certain number of rows of the same number.
[E] finding how many more one set has than another.
[F] finding how many ways we can pair objects in 2 sets.
[G] how many rows when we put a set into rows having the same number.
[H] how many in all for 3 sets having different numbers of objects.

3. Solve the equations.

[A] $\boxed{n} + 6 = 11$
[B] $8 + \boxed{n} = 15$
[C] $3 \times \boxed{n} = 18$
[D] $\boxed{n} \times 8 = 24$
[E] $50 \div 5 = \boxed{n}$
[F] $8 - \boxed{n} = 6$
[G] $10 \div \boxed{n} = 2$
[H] $42 \div \boxed{n} = 6$
[I] $\boxed{n} - 8 = 6$
[J] $\boxed{n} \div 6 = 5$

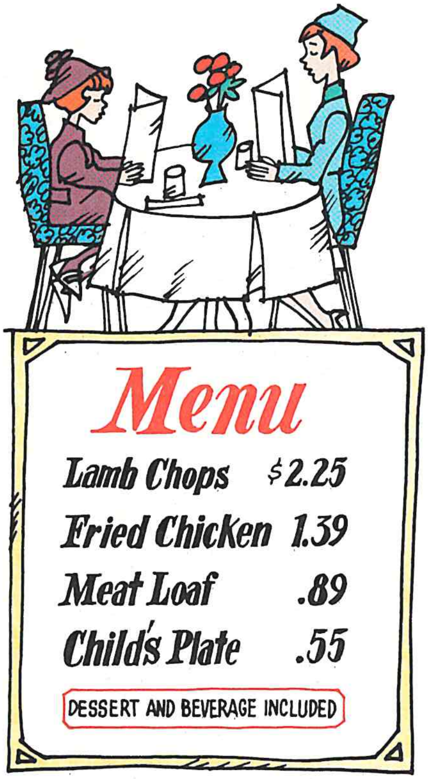
Think

A train that is 1 mile long is traveling 1 mile each 3 minutes. How long does it take this train to pass through a 2-mile tunnel?



EATING AT THE RESTAURANT

Kay and her mother went to a large restaurant in the city. This is the menu they used to order their lunch.



Menu

Lamb Chops	$2.25
Fried Chicken	1.39
Meat Loaf	.89
Child's Plate	.55

DESSERT AND BEVERAGE INCLUDED

1. There are 36 tables in the restaurant. There are 4 chairs at each table. How many chairs are there?

2. There were 9 waiters. How many tables might be assigned to each waiter?

3. The waiters filled 1 pitcher of water for each 4 people. Kay counted 56 people. How many pitchers of water did they need?

4. Kay had meat loaf. Her mother had lamb chops. What was the total cost of their lunches?

5. Kay's mother gave the waiter $3.50. How much change did she get back?

6. Their lunch cost about $3.00. Kay's mother decided to tip the waiter 15 cents for each dollar that the lunch cost. How much extra did she give the waiter for his good service?

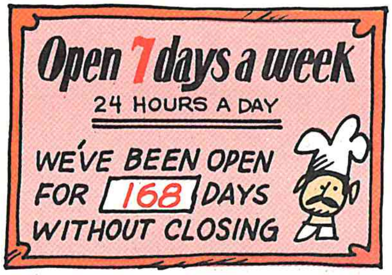
. If Kay had bought a children's plate and her mother had bought chicken, what would the total cost have been?

. There was a party room at the restaurant. There were 360 people at a special lunch in this room. 8 people sat at each table. How many tables did they need?

. Kay saw this sign in the window.

[A] How many weeks has the restaurant been open without closing?

★ [B] How many hours has it been open without closing?

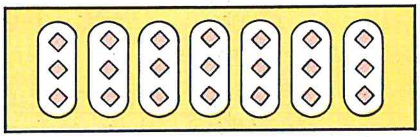


Open 7 days a week
24 HOURS A DAY
WE'VE BEEN OPEN FOR 168 DAYS WITHOUT CLOSING

Chapter review

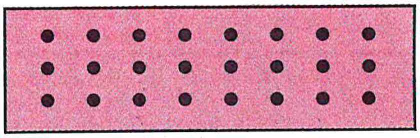
1. Write a division equation to answer each question.

[A]



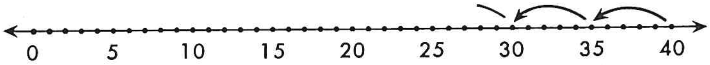
How many sets of 3 are in a set of 21?

[B]



If we put 24 dots into 3 sets of the same number, how many dots are in each set?

[C]



Starting at 40, how many jumps of 5 does it take to get to 0?

[D] $\begin{array}{r} 42 \\ -7 \\ \hline 35 \end{array} \nearrow \begin{array}{r} 35 \\ -7 \\ \hline 28 \end{array} \nearrow \begin{array}{r} 28 \\ -7 \\ \hline \end{array}$ . . .

Starting with 42, how many times do we subtract 7 to get 0?

[E] 56, 48, 40, . . .

Starting at 56, how many times do we subtract 8 to get to 0?

[F] $\boxed{n} \times 9 = 54$ What number times 9 gives 54?

2. Find the quotients.

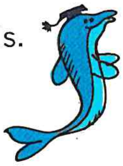
Since $11 \times 23 = 253$, we know that
→ $253 \div 23 = \boxed{n}$.
→ $253 \div 11 = \boxed{n}$.

3. Find the quotients.

[A] $64 \div 8$
[B] $28 \div 4$
[C] $20 \div 5$
[D] $18 \div 6$
[E] $27 \div 9$
[F] $45 \div 5$
[G] $42 \div 7$
[H] $36 \div 6$
[I] $49 \div 7$
[J] $40 \div 8$
[K] $48 \div 6$
[L] $54 \div 6$
[M] $24 \div 6$
[N] $32 \div 8$
[O] $56 \div 8$
[P] $72 \div 9$
[Q] $81 \div 9$
[R] $18 \div 2$
[S] $25 \div 5$
[T] $45 \div 5$
[U] $30 \div 5$
[V] $36 \div 9$
[W] $16 \div 4$
[X] $35 \div 7$

Think

Brian's father weighs 100 pounds more than Brian. Together they weigh 240 pounds. How much does Brian weigh?



4. Find the quotients.

[A] $5\overline{)315}$ [B] $6\overline{)264}$ [C] $3\overline{)228}$ [D] $4\overline{)372}$ [E] $2\overline{)168}$

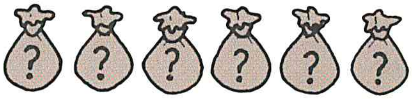
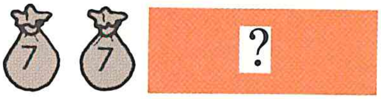
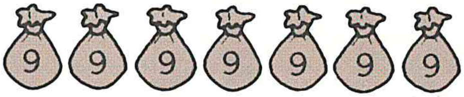
[F] $4\overline{)300}$ [G] $7\overline{)700}$ [H] $6\overline{)420}$ [I] $8\overline{)272}$ [J] $9\overline{)558}$

5. Find the quotients and the remainders.

[A] $3\overline{)128}$ [B] $5\overline{)342}$ [C] $7\overline{)618}$ [D] $6\overline{)415}$ [E] $4\overline{)321}$

[F] $2\overline{)101}$ [G] $8\overline{)327}$ [H] $6\overline{)243}$ [I] $4\overline{)219}$ [J] $9\overline{)576}$

[K] $5\overline{)314}$ [L] $3\overline{)194}$ [M] $7\overline{)627}$ [N] $6\overline{)245}$ [O] $9\overline{)706}$

6.	258 marbles		How many in each bag?
7.	175 marbles		How many bags?
8.	?		How many marbles?

9. Jan had 35 balloons for her party. There were 8 children at the party. Each child got the same number of balloons, and there were 3 left over. How many balloons did each child get?

10. Jim had 50 cents. Table tennis balls cost 9 cents each.

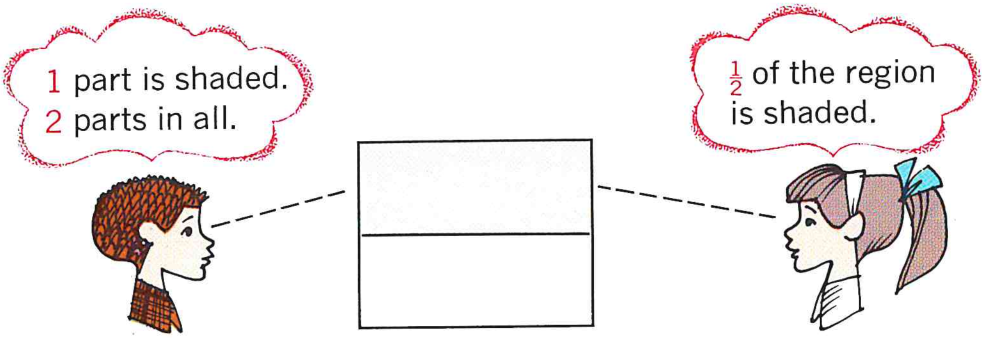
[A] How many could he buy?
[B] If he bought only 3 balls, how much money would he have left?
[C] If he bought as many as he could, how much money would he have left?

11. Sara had 75 cents when she went shopping.

[A] How many pencils could she buy if they were 6 cents each?
[B] How much would she have left if she bought as many pencils as she could?
[C] If pencils were 9 cents each, how many could she buy? How much money would she have left?

CHAPTER 10 Fractions

Number pairs and fractions


1 part is shaded.
2 parts in all.
$\frac{1}{2}$ of the region is shaded.

Dan is thinking of the pair of numbers 1 and 2.

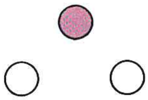
Sara is thinking of the fraction $\frac{1}{2}$ (one half).

DISCUSSION EXERCISES

For each exercise, give the number pair and the fraction for the shaded part of the region or set.

1.

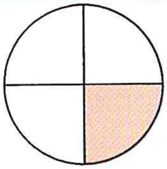
▥ figure is shaded.
▥ figures in all.



▥/▥ of the figures are shaded.

2.

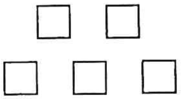
▥ part is shaded.
▥ parts in all.



▥/▥ of the region is shaded.

3.

▥ figure is shaded.
▥ figures in all.



▥/▥ of the figures are shaded.

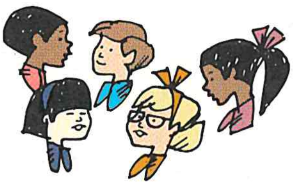
- ▶ For $\frac{1}{3}$, we read "one third."
- ▶ For $\frac{1}{4}$, we read "one fourth."
- ▶ For $\frac{1}{5}$, we read "one fifth."

EXERCISES

In exercises 1 to 4, give the whole numbers for parts **A** and **B**. Then give the fraction for **C**.

1. [**A**] |||||| of the children wears glasses.

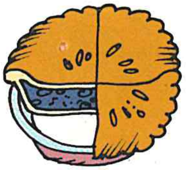
[**B**] |||||| children in all.



[**C**] $\frac{||||}{||||}$ of the children wear glasses.

2. [**A**] |||||| piece of pie is missing.

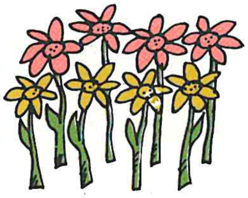
[**B**] |||||| pieces of pie at the beginning.



[**C**] $\frac{||||}{||||}$ of the pie is missing.

3. [**A**] |||||| row has pink blossoms.

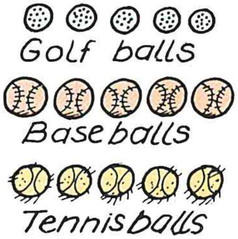
[**B**] |||||| rows in all.



[**C**] $\frac{||||}{||||}$ of the plants have pink blossoms on them.

4. [**A**] |||||| row of baseballs.

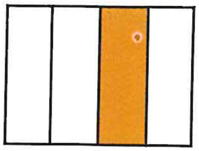
[**B**] |||||| rows of balls in all.



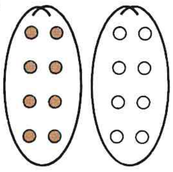
[**C**] $\frac{||||}{||||}$ of the rows of balls are baseballs.

. Write a fraction to tell what part of the region or set is shaded.

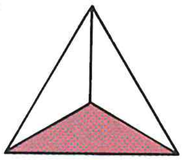
[**A**]



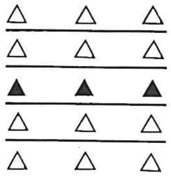
[**B**]



[**C**]



[**D**]

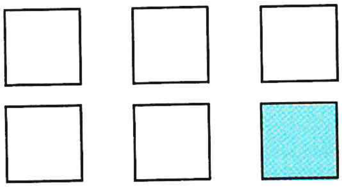


Using fractions

DISCUSSION EXERCISES

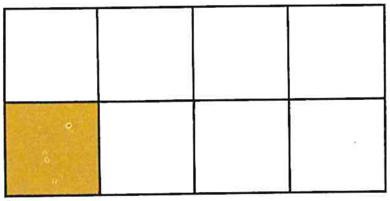
1. [A] Give a number pair to explain what part of the set is shaded.

   [B] Give a fraction that tells what part of the set is shaded.



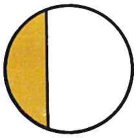
2. [A] Give a number pair to explain what part of the region is shaded.

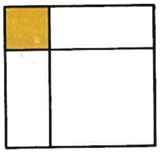
   [B] Give a fraction that tells what part of the region is shaded.



3. [A] Explain why you would **not** say that $\frac{1}{2}$ of the circular region is shaded.

   [B] Explain why you would **not** say that $\frac{1}{4}$ of the square region is shaded.

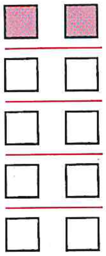




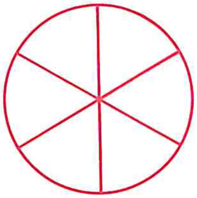
EXERCISES

1. Write $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, or $\frac{1}{8}$ to tell what part of each object or set is shaded.

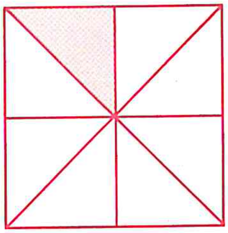
[A]



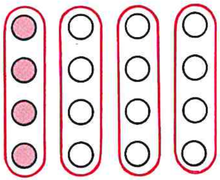
[B]



[C]



[D]

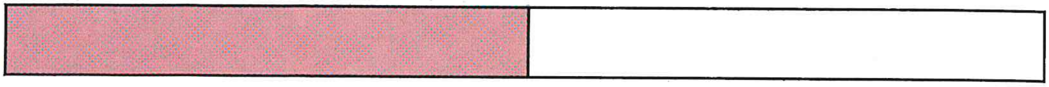


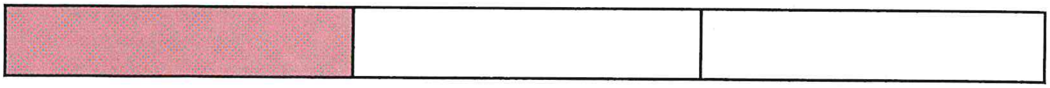
Think

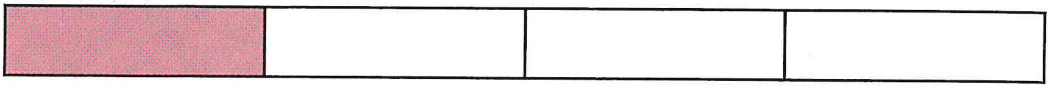
Here's what you may do
To multiply by me:
Twice multiply by ten
Then multiply by three.

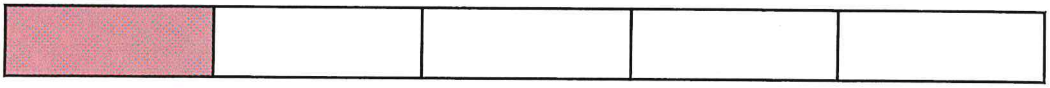
WHO AM I?

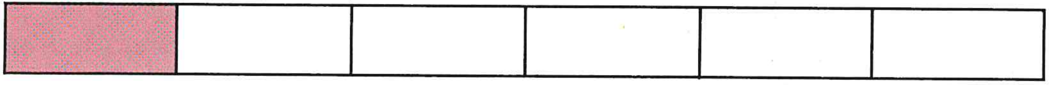
2. Give the fraction that tells what part of the bar is shaded.

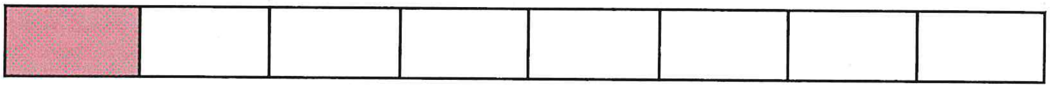
[A]


[B]


[C]


[D]


[E]


[F]


3. Tell which fraction of a given object is more. Use your answers to exercise 2 if you need help.

[A] $\frac{1}{4}$ or $\frac{1}{6}$

[B] $\frac{1}{6}$ or $\frac{1}{3}$

[C] $\frac{1}{3}$ or $\frac{1}{8}$

[D] $\frac{1}{8}$ or $\frac{1}{4}$

[E] $\frac{1}{6}$ or $\frac{1}{8}$

Short stories

1. Had 6 baseball cards.
Gave away $\frac{1}{2}$ of them.
Had how many left?

2. Store had 6 lollipops.
Bought $\frac{1}{3}$ of them.
Bought how many?

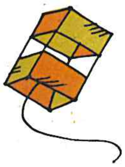
3. 10 children.
Half of them are girls.
How many girls?

4. 5 children.
1 girl.
What fraction is girls?

5. 8 children.
$\frac{1}{4}$ of them wear glasses.
How many wear glasses?

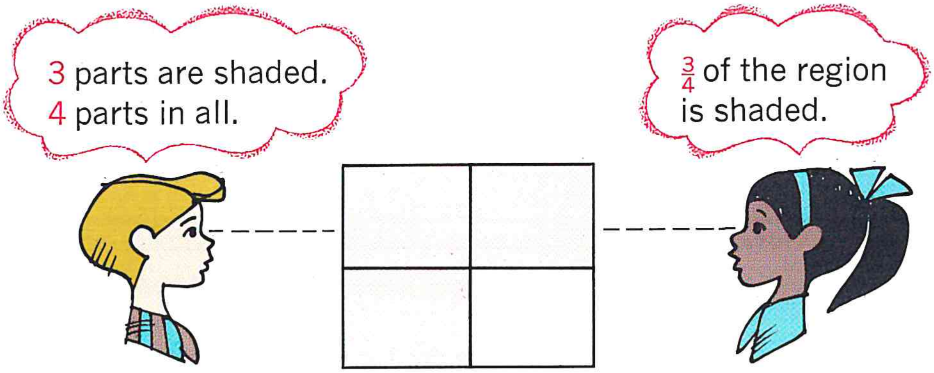
6. 6 apples.
1 is rotten.
What fraction is rotten?

7. 12 cupcakes.
$\frac{1}{4}$ of them are chocolate.
How many are chocolate?



8. 10 kites.
$\frac{1}{5}$ are box kites.
How many are box kites?

More about fractions and number pairs


3 parts are shaded.
4 parts in all.
$\frac{3}{4}$ of the region is shaded.

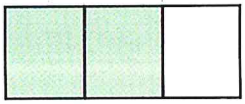
Robert is thinking of the number pair 3 and 4.

Joanne is thinking of the fraction $\frac{3}{4}$ (three fourths).

DISCUSSION EXERCISES

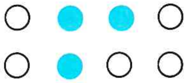
For each exercise, give the number pair and the fraction for the shaded part of the region or set.

1. ▯ parts are shaded.
▯ parts in all.



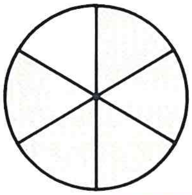
$\frac{▯}{▯}$ of the region is shaded.

2. ▯ of the figures are shaded.
▯ figures in all.



$\frac{▯}{▯}$ of the set is shaded.

3. ▯ parts are shaded.
▯ parts in all.



$\frac{▯}{▯}$ of the region is shaded.

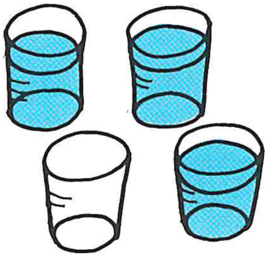
- ▶ For $\frac{2}{3}$, we read "two thirds."
- ▶ For $\frac{3}{8}$, we read "three eighths."
- ▶ For $\frac{5}{6}$, we read "five sixths."

EXERCISES

For exercises 1 to 4, give the whole number for parts **A** and **B**. Then give the fraction for **C**.

1. [**A**] □ of the glasses are full.

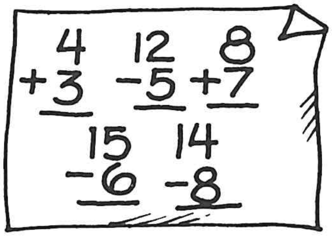
[**B**] □ glasses in all.



[**C**] $\frac{\square}{\square}$ of the glasses are full.

2. [**A**] □ of the problems are addition.

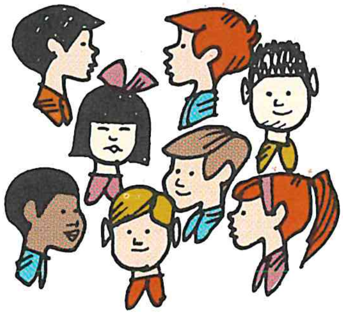
[**B**] □ problems in all.



[**C**] $\frac{\square}{\square}$ of the problems are addition.

3. [**A**] □ of the children are boys.

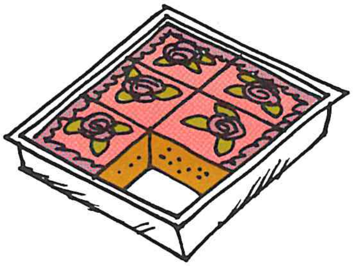
[**B**] □ children in all.



[**C**] $\frac{\square}{\square}$ of the children are boys.

4. [**A**] □ pieces of party cake left in the pan.

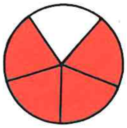
[**B**] □ pieces of party cake in the pan at the beginning.



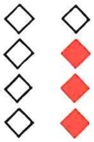
[**C**] $\frac{\square}{\square}$ of the party cake left in the pan.

. Write a fraction to tell what part of the region or set is shaded.

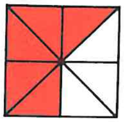
[**A**]



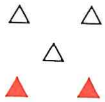
[**B**]



[**C**]



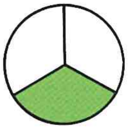
[**D**]



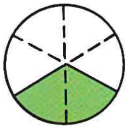
Equivalent fractions

Sometimes two different fractions remind us of the same amount of an object or the same number of objects from a set. Such fractions are called equivalent fractions.

$\frac{1}{3}$



$\frac{2}{6}$

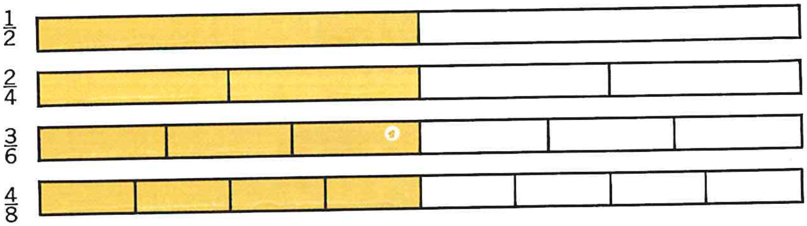


$\frac{1}{3}$ is equivalent to $\frac{2}{6}$.

DISCUSSION EXERCISES

1. Explain how the figure below shows that $\frac{2}{4}$ is equivalent to $\frac{3}{6}$.

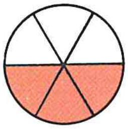
2. Name other pairs of equivalent fractions from the figure below.



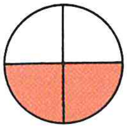
EXERCISES

1. $\frac{2}{4}$ is equivalent to $\frac{3}{6}$.
   - [A] Which picture reminds you of $\frac{2}{4}$?
   - [B] Which picture reminds you of $\frac{3}{6}$?
2. $\frac{1}{2}$ is equivalent to $\frac{4}{8}$.
   - [A] Which picture reminds you of $\frac{4}{8}$?
   - [B] Which picture reminds you of $\frac{1}{2}$?
3. $\frac{2}{3}$ is equivalent to $\frac{4}{6}$.
   - [A] Which picture reminds you of $\frac{2}{3}$?
   - [B] Which picture reminds you of $\frac{4}{6}$?
4. $\frac{3}{4}$ is equivalent to $\frac{6}{8}$.
   - [A] Which picture reminds you of $\frac{6}{8}$?
   - [B] Which picture reminds you of $\frac{3}{4}$?

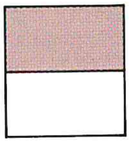
A



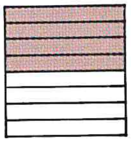
B



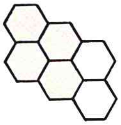
C



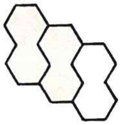
D



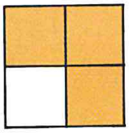
E



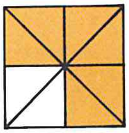
F



G

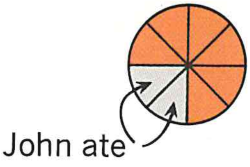


H



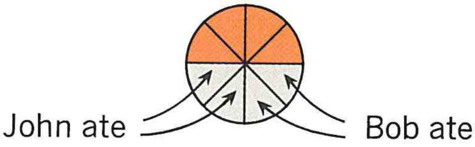
Fraction problems

1. A pie was cut into 8 pieces of the same size. John ate 2 pieces.
Give two fractions that remind you of the part of the pie that John ate.

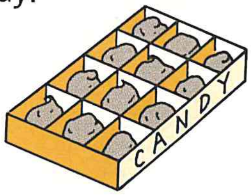


2. Give two fractions that remind you of the part of the pie that John did not eat.

3. Bob ate 2 pieces of the same pie.
Give three fractions that remind you of the part of the pie that was left.



4. A box held 12 pieces of candy.
Jim ate $\frac{1}{2}$ of the candy, and Jane ate $\frac{1}{3}$ of the candy.
   - [A] How many sixths of the candy did Jim eat?
   - [B] How many sixths of the candy did Jane eat?
   - [C] Was all the candy gone?
   - [D] How many pieces were left?

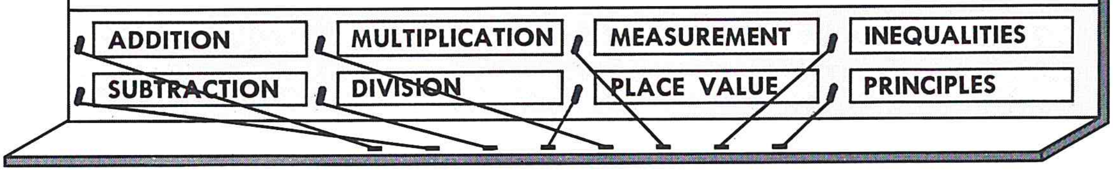


5. Jack had a bag of 24 marbles. He gave $\frac{1}{2}$ of them to Bill and $\frac{1}{4}$ of them to Sam.
   - [A] What part of the marbles did Jack give away?
   - [B] What part of the marbles did Jack keep?

6. For each exercise, tell which is the larger part of a pie.
   - [A] $\frac{1}{3}$ or $\frac{4}{8}$
   - [B] $\frac{3}{4}$ or $\frac{2}{3}$
   - [C] $\frac{4}{6}$ or $\frac{3}{4}$
   - [D] $\frac{1}{4}$ or $\frac{1}{5}$
   - [E] $\frac{1}{6}$ or $\frac{1}{3}$
   - [F] $\frac{1}{6}$ or $\frac{1}{8}$
   - [G] $\frac{1}{7}$ or $\frac{1}{8}$
   - [H] $\frac{1}{2}$ or $\frac{2}{3}$
   - [I] $\frac{3}{4}$ or $\frac{7}{8}$
   - [J] $\frac{1}{2}$ or $\frac{1}{8}$
   - [K] $\frac{1}{5}$ or $\frac{1}{2}$
   - [L] $\frac{3}{4}$ or $\frac{1}{2}$

7. Jerry had some marbles. He gave $\frac{1}{3}$ of them to Bob and $\frac{1}{3}$ of them to Alan.
   - [A] What part of the marbles did Jerry give away?
   - [B] What part of the marbles did Jerry have left?
   - [C] If Jerry had 6 marbles left, how many did he give away?
   - [D] If Jerry had 10 marbles left, how many did he have at the start?

Keeping in Touch with . . .



1. Write the numeral for each exercise.

   [A] 9 tens and 6 [B] 2 hundreds, 5 tens, and 8 [C] 7 hundreds and 5

   [D] 5 thousands and 6 hundreds [E] 4 thousands and 4 tens

2. Find the sums and differences.

   [A] $\begin{array}{r} 38 \\ +27 \\ \hline \end{array}$ [B] $\begin{array}{r} 72 \\ -36 \\ \hline \end{array}$ [C] $\begin{array}{r} 143 \\ -65 \\ \hline \end{array}$ [D] $\begin{array}{r} 79 \\ +68 \\ \hline \end{array}$ [E] $\begin{array}{r} 243 \\ +789 \\ \hline \end{array}$ [F] $\begin{array}{r} 1246 \\ -539 \\ \hline \end{array}$

3. Find the products.

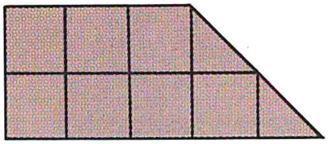
   [A] $\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$ [B] $\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$ [C] $\begin{array}{r} 15 \\ \times 3 \\ \hline \end{array}$ [D] $\begin{array}{r} 28 \\ \times 6 \\ \hline \end{array}$ [E] $\begin{array}{r} 75 \\ \times 3 \\ \hline \end{array}$ [F] $\begin{array}{r} 256 \\ \times 4 \\ \hline \end{array}$

4. Solve the equations.

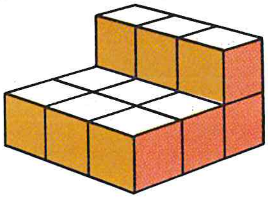
   [A] $8 + \boxed{n} = 11$ [C] $48 \div 6 = \boxed{n}$ [E] $13 - \boxed{n} = 9$

   [B] $12 - 5 = \boxed{n}$ [D] $7 \times \boxed{n} = 28$ [F] $32 \div 4 = \boxed{n}$

5. Find the area.



6. Find the volume.



Think

In the figure below, each ▥ covers the same digit. Find that digit.

$$\begin{array}{r} 4▥ \\ \times ▥ \\ \hline 27▥ \end{array}$$

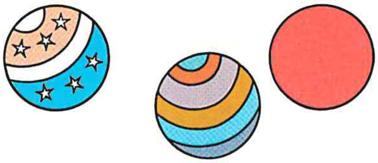
7. Solve: If $37 \times 59 = 2153$, then $59 \times 37 = \boxed{n}$.

8. Give the correct symbol, > or <: 3268 ◍ 3258

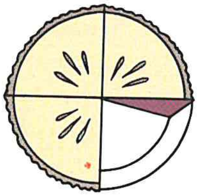
9. Jane had 3 quarters, 3 nickels, and 3 pennies. How much money did she have?

Chapter review

1. [A] How many of the balls are red?
   [B] How many balls in all?
   [C] What fraction of the balls are red?

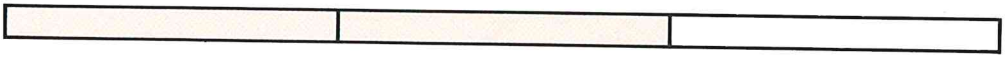


2. [A] How many pieces of pie are left?
   [B] The pie was cut into how many pieces?
   [C] What fraction of the pie is left?

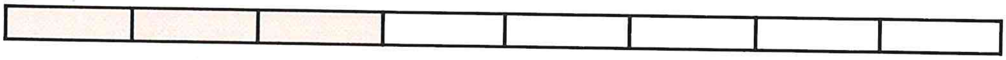


3. Give a fraction to tell what part of the bar is shaded.

[A]



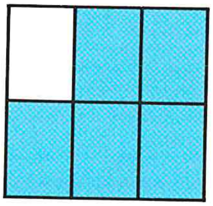
[B]



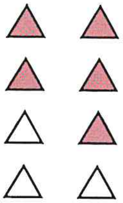
4. Which is the **larger** part of an object, $\frac{2}{3}$ or $\frac{3}{8}$?

5. Give a fraction to tell what part of each figure or set is shaded.

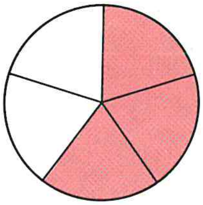
[A]



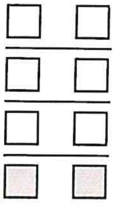
[B]



[C]

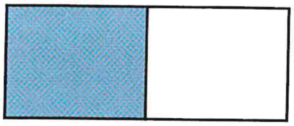


[D]

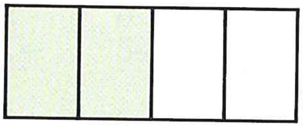


6. Give a fraction to tell what part of each figure is shaded.

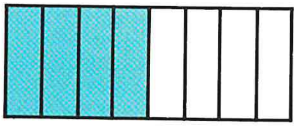
[A]



[B]



[C]



. Use exercise 6 to name a pair of equivalent fractions.

. Janet had 9 cookies. She gave $\frac{1}{3}$ of them to a friend. How many did she give away?

Supplementary Exercises

Set 1 *For use after page 33*

	a	b	c	d	e	f	g	h	i	j
1.	0 +1	3 +5	0 +3	1 +2	0 +4	1 +5	4 +2	4 +1	6 +2	5 +0
2.	2 +4	0 +2	7 +0	6 +1	0 +6	1 +7	7 +1	9 +0	2 +1	1 +3
3.	2 +6	2 +5	4 +4	1 +8	2 +0	0 +5	5 +3	2 +2	0 +7	3 +3
4.	3 +4	1 +1	0 +8	1 +6	3 +6	5 +2	8 +1	0 +0	3 +0	2 +7
5.	6 +3	7 +2	8 +0	1 +4	3 +2	4 +5	3 +1	1 +0	0 +9	4 +3
6.	5 +4	4 +0	5 +1	2 +3	6 +0	9 +1	2 +8	7 +3	4 +6	5 +5

Set 2 *For use after page 35*

	a	b	c	d	e	f	g	h	i	j
1.	9 +2	3 +7	6 +5	8 +4	6 +6	4 +9	1 +9	6 +4	8 +6	9 +4
3.	9 +3	8 +2	2 +9	5 +7	6 +8	8 +7	9 +8	8 +3	7 +4	5 +9
3.	7 +7	9 +5	5 +6	3 +9	7 +8	8 +9	9 +7	4 +7	9 +9	7 +9
4.	8 +8	7 +6	3 +8	5 +8	6 +9	4 +8	6 +7	9 +6	8 +5	7 +5

Set 3 *For use after page 33*

	a	b	c	d	e	f	g	h	i	j
1.	3 −0	5 −1	8 −7	4 −4	1 −0	2 −2	2 −1	8 −2	3 −2	7 −5
2.	6 −6	6 −4	2 −0	1 −1	4 −3	7 −1	4 −2	5 −0	8 −8	6 −2
3.	3 −1	4 −0	7 −7	7 −6	4 −1	7 −2	6 −3	9 −4	8 −6	9 −7
4.	8 −1	9 −2	5 −3	3 −3	6 −1	7 −0	5 −4	8 −0	8 −5	9 −9
5.	9 −5	6 −5	9 −3	9 −6	0 −0	9 −8	5 −2	9 −1	8 −3	5 −5
6.	9 −0	7 −4	7 −3	6 −0	8 −4	10 −9	10 −2	10 −7	10 −4	10 −5

Set 4 *For use after page 37*

	a	b	c	d	e	f	g	h	i	j
1.	14 −7	10 −6	13 −8	11 −8	12 −9	15 −7	13 −4	11 −2	10 −1	11 −3
2.	10 −3	11 −7	11 −9	10 −8	11 −4	12 −3	13 −5	14 −6	15 −8	17 −9
3.	12 −7	12 −8	11 −6	12 −5	13 −7	13 −9	12 −6	14 −5	18 −9	14 −9
4.	11 −5	15 −6	12 −4	16 −8	13 −6	16 −7	14 −8	16 −9	17 −8	15 −9

Set 5 *For use after page 33*

Ⓐ

	a	b	c	d	e	f	g	h	i	j
1.	4 1 +2	2 4 +3	1 5 +2	2 5 +3	3 1 +0	6 2 +2	5 1 +2	3 1 +6	4 3 +2	3 4 +3
2.	6 2 +4	3 7 +6	5 3 +5	2 6 +8	9 4 +1	7 3 +7	2 8 +8	4 7 +6	5 5 +9	8 2 +5

Ⓑ

1.	5 2 +1	1 5 +1	2 3 +4	2 1 +7	3 0 +5	1 6 +2	5 3 +2	3 2 +2	6 3 +0	2 4 +2
2.	6 4 +3	7 3 +6	9 1 +8	2 8 +7	5 5 +4	6 8 +2	7 2 +3	1 5 +9	8 9 +2	5 8 +5

CODED ANSWERS, SET 5, PART A: 1. (a) D, (b) E, (c) G, (d) AF, (e) I, (f) AF, (g) G, (h) AF, (i) E, (j) AF; **2.** (a) AJ, (b) AH, (c) AB, (d) AH, (e) AI, (f) AD, (g) AG, (h) AD, (i) AE, (j) AC

Set 6 *For use after page 35*

Ⓐ

	a	b	c
1.	$2 + 5 + 3 = \boxed{n}$	$6 + 2 + 4 = \boxed{n}$	$3 + 2 + 9 = \boxed{n}$
2.	$3 + 4 + 6 = \boxed{n}$	$5 + 9 + 5 = \boxed{n}$	$6 + 7 + 4 = \boxed{n}$
3.	$5 + 7 + 6 = \boxed{n}$	$9 + 6 + 3 = \boxed{n}$	$8 + 7 + 2 = \boxed{n}$
4.	$9 + 4 + 1 + 3 = \boxed{n}$	$6 + 2 + 4 + 8 = \boxed{n}$	$2 + 7 + 8 + 1 = \boxed{n}$
5.	$8 + 4 + 2 + 6 = \boxed{n}$	$5 + 3 + 4 + 3 = \boxed{n}$	$1 + 0 + 6 + 8 = \boxed{n}$

Ⓑ

1.	$3 + 4 + 1 = \boxed{n}$	$5 + 4 + 1 = \boxed{n}$	$4 + 3 + 5 = \boxed{n}$
2.	$6 + 3 + 6 = \boxed{n}$	$4 + 8 + 4 = \boxed{n}$	$2 + 8 + 7 = \boxed{n}$
3.	$5 + 8 + 0 = \boxed{n}$	$6 + 7 + 4 = \boxed{n}$	$6 + 6 + 3 = \boxed{n}$
4.	$3 + 2 + 4 + 1 = \boxed{n}$	$5 + 4 + 5 + 5 = \boxed{n}$	$8 + 7 + 2 + 1 = \boxed{n}$
5.	$9 + 1 + 6 + 1 = \boxed{n}$	$8 + 3 + 2 + 3 = \boxed{n}$	$9 + 6 + 3 + 0 = \boxed{n}$

CODED ANSWERS, SET 6, PART A: 1. (a) DE, (b) DA, (c) DJ; **2.** (a) DB, (b) DC, (c) DG; **3.** (a) DI, (b) DI, (c) DG; **4.** (a) DG, (b) AE, (c) DI; **5.** (a) AE, (b) DH, (c) DH

Set 7 *For use after page 37*

A

	a	b	c	d
1.	$5+\boxed{n}=9$	$9=\boxed{n}-4$	$\boxed{n}+2=11$	$12-\boxed{n}=6$
2.	$5+9=\boxed{n}$	$15-7=\boxed{n}$	$9=\boxed{n}-6$	$7=15-\boxed{n}$

B

1.	$\boxed{n}+3=7$	$14=9+\boxed{n}$	$15-9=\boxed{n}$	$8+5=\boxed{n}$
2.	$13-\boxed{n}=8$	$\boxed{n}-3=10$	$\boxed{n}=16-7$	$8=14-\boxed{n}$

CODED ANSWERS, SET 7, PART A: 1. (a) C, (b) AI, (c) G, (d) F; **2.** (a) AC, (b) D, (c) AH, (d) D

Set 8 *For use after page 43*

A

	a	b	c	d	e	f	g	h	i
1.	16	13	4	11	23	5	56	37	7
	+2	+5	+14	+7	+4	+31	+3	+2	+52

	a	b	c	d
2.	$35+4=\boxed{n}$	$27+0=\boxed{n}$	$5+23=\boxed{n}$	$20+8=\boxed{n}$

B

1.	13	12	12	4	26	51	37	84	72
	+4	+7	+3	+15	+3	+4	+1	+4	+5

2.	$33+4=\boxed{n}$	$55+4=\boxed{n}$	$54+5=\boxed{n}$	$98+1=\boxed{n}$

CODED ANSWERS, SET 8, PART A: 1. (a) EI, (b) EI, (c) EI, (d) EI, (e) AB, (f) CD, (g) HF, (h) CF, (i) HF; **2.** (a) CF, (b) AB, (c) AI, (d) AI

Set 9 *For use after page 55*

A

	a	b	c	d	e	f	g	h	i
1.	20	30	50	30	10	30	70	40	90
	+40	+30	+20	+60	+40	+40	+20	+40	+10

	a	b	c	d
2.	$30+80=\boxed{n}$	$90+60=\boxed{n}$	$70+60=\boxed{n}$	$60+40=\boxed{n}$

B

1.	30	10	60	80	60	20	50	40	50
	+50	+20	+20	+10	+30	+50	+50	+20	+40

2.	$60+50=\boxed{n}$	$70+60=\boxed{n}$	$40+90=\boxed{n}$	$60+80=\boxed{n}$

CODED ANSWERS, SET 9, PART A: 1. (a) DA, (b) DA, (c) GA, (d) FA, (e) HA, (f) GA, (g) FA, (h) EA, (i) JAA; **2.** (a) JJA, (b) JHA, (c) JIA, (d) JAA

Set 10 *For use after page 55*

		a	b	c	d	e	f	g	h	i
A	**1.**	30 20 +40	50 40 +30	60 40 +70	40 30 +80	90 40 +30	60 50 +40	80 70 +30	90 60 +10	90 20 +80

	a	b	c	d
2.	$50+20+10=\boxed{n}$	$40+30+30=\boxed{n}$	$80+40+20=\boxed{n}$	$60+70+70=\boxed{n}$

B	**1.**	20 10 +50	60 20 +20	30 30 +70	10 80 +90	50 40 +50	40 50 +70	20 60 +50	30 70 +90	80 60 +60

2. $50+60+20=\boxed{n}$ $60+50+40=\boxed{n}$ $80+70+50=\boxed{n}$ $90+20+90=\boxed{n}$

CODED ANSWERS, SET 10, PART A: 1. (a) IB, (b) ECB, (c) EFB, (d) EDB, (e) EAB, (f) EDB, (g) EGB, (h) EAB, (i) EIB; **2.** (a) GB, (b) EBB, (c) EJB, (d) CBB

Set 11 *For use after page 57*

	a	b	c	d	e	f	g	h	i
A	30 +46	37 +22	50 +27	32 +56	24 +63	35 +54	61 +18	25 +42	11 +62
B	31 +24	45 +31	18 +51	12 +86	37 +61	49 +40	20 +68	80 +13	42 +46

CODED ANSWERS, SET 11, PART A: (a) DJ, (b) AF, (c) DD, (d) GG, (e) GD, (f) GF, (g) DF, (h) JD, (i) DC

Set 12 *For use after page 58*

	a	b	c	d	e	f	g	h
A	432 +264	507 +462	326 +453	856 +133	750 +108	513 +264	472 +516	635 +344
B	238 +421	340 +640	279 +420	345 +534	718 +271	256 +623	808 +190	456 +522

CODED ANSWERS, SET 12, PART A: (a) BGB, (b) GBG, (c) FFG, (d) GIG, (e) IDI, (f) FFF, (g) GII, (h) GFG

Set 13 *For use after page 58*

	a	b	c	d	e	f	g	h
A	36 +92	27 +81	13 +94	45 +84	34 +74	72 +66	73 +73	51 +75
B	24 +85	76 +32	64 +85	83 +76	91 +67	72 +97	94 +94	82 +95

CODED ANSWERS, SET 13, PART A: (a) EIH, (b) EDH, (c) EDC, (d) EIJ, (e) EDH, (f) EAH, (g) EFG, (h) EIG

Set 14 *For use after page 61*

		a	b	c	d
A	**1.**	$34 - 3 = \boxed{n}$	$57 - 4 = \boxed{n}$	$64 - 4 = \boxed{n}$	$29 - 0 = \boxed{n}$
	2.	$78 - 5 = \boxed{n}$	$96 - 5 = \boxed{n}$	$87 - 5 = \boxed{n}$	$39 - 4 = \boxed{n}$
B	**1.**	$27 - 4 = \boxed{n}$	$38 - 1 = \boxed{n}$	$56 - 5 = \boxed{n}$	$49 - 6 = \boxed{n}$
	2.	$67 - 5 = \boxed{n}$	$89 - 9 = \boxed{n}$	$98 - 4 = \boxed{n}$	$45 - 3 = \boxed{n}$

CODED ANSWERS, SET 14, PART A: 1. (a) BA, (b) CB, (c) HF, (d) JE; **2.** (a) DB, (b) EA, (c) GJ, (d) BC

Set 15 *For use after page 63*

	a	b	c	d	e	f	g	h	i
A	43 −10	60 −20	67 −30	59 −32	47 −13	56 −20	83 −40	90 −50	46 −41
B	68 −30	70 −40	49 −30	94 −20	90 −20	68 −33	78 −52	93 −53	68 −62

CODED ANSWERS, SET 15, PART A: (a) BB, (b) JE, (c) BG, (d) AG, (e) BJ, (f) BF, (g) JB, (h) JE, (i) H

Set 16 *For use after page 63*

	a	b	c	d	e	f	g	h
A	460 −150	463 −322	872 −541	768 −306	952 −340	638 −414	846 −313	794 −510
B	390 −240	576 −215	898 −344	792 −410	856 −313	984 −753	649 −132	977 −377

CODED ANSWERS, SET 16, PART A: (a) IAB, (b) ACA, (c) IIA, (d) CFJ, (e) FAJ, (f) JJC, (g) HII, (h) JDC

Set 17 *For use after page 67*

Ⓐ	a	b	c	d
1.	$64 + 3 = \boxed{n}$	$35 + 4 = \boxed{n}$	$30 + 6 = \boxed{n}$	$22 + 4 = \boxed{n}$
2.	$62 + \boxed{n} = 68$	$73 + \boxed{n} = 78$	$\boxed{n} + 44 = 49$	$\boxed{n} + 71 = 79$
3.	$72 + 8 = \boxed{n}$	$56 + 4 = \boxed{n}$	$83 + 7 = \boxed{n}$	$\boxed{n} + 45 = 50$
4.	$47 + 9 = \boxed{n}$	$8 + 53 = \boxed{n}$	$6 + 86 = \boxed{n}$	$37 + 8 = \boxed{n}$
5.	$\boxed{n} = 33 + 9$	$\boxed{n} = 54 + 8$	$76 + 9 = \boxed{n}$	$\boxed{n} = 39 + 8$
6.	$68 + 8 = \boxed{n}$	$\boxed{n} = 94 + 9$	$17 + 9 = \boxed{n}$	$46 + 5 = \boxed{n}$

Ⓑ				
1.	$36 + 3 = \boxed{n}$	$47 + 2 = \boxed{n}$	$50 + 7 = \boxed{n}$	$38 + 1 = \boxed{n}$
2.	$32 + \boxed{n} = 38$	$24 + \boxed{n} = 29$	$\boxed{n} + 54 = 58$	$\boxed{n} + 31 = 39$
3.	$58 + 2 = \boxed{n}$	$37 + 3 = \boxed{n}$	$84 + 6 = \boxed{n}$	$\boxed{n} + 65 = 70$
4.	$56 + 9 = \boxed{n}$	$67 + 4 = \boxed{n}$	$5 + 39 = \boxed{n}$	$56 + 8 = \boxed{n}$
5.	$\boxed{n} = 43 + 8$	$\boxed{n} = 86 + 7$	$45 + 8 = \boxed{n}$	$\boxed{n} = 84 + 8$
6.	$47 + 7 = \boxed{n}$	$\boxed{n} = 85 + 9$	$19 + 6 = \boxed{n}$	$29 + 7 = \boxed{n}$

CODED ANSWERS, SET 17, PART A: **1.** (a) DB, (b) CF, (c) CD, (d) AD; **2.** (a) D, (b) H, (c) H, (d) I; **3.** (a) IJ, (b) DJ, (c) FJ, (d) H; **4.** (a) HD, (b) DE, (c) FA, (d) GH; **5.** (a) GA, (b) DA, (c) IH, (d) GB; **6.** (a) BD, (b) EJC, (c) AD, (d) HE

Set 18 *For use after page 67*

Ⓐ	a	b	c	d
1.	$46 + \boxed{n} = 51$	$83 = 75 + \boxed{n}$	$96 = 9 + \boxed{n}$	$34 = \boxed{n} + 25$
2.	$176 + 4 = \boxed{n}$	$324 + 8 = \boxed{n}$	$657 + 9 = \boxed{n}$	$432 + 9 = \boxed{n}$
3.	$7 + 366 = \boxed{n}$	$9 + 238 = \boxed{n}$	$\boxed{n} = 657 + 4$	$\boxed{n} = 8 + 343$
4.	$434 + 9 = \boxed{n}$	$7 + 367 = \boxed{n}$	$\boxed{n} = 847 + 6$	$369 + 5 = \boxed{n}$
5.	$630 + 10 = \boxed{n}$	$586 + 6 = \boxed{n}$	$987 + 8 = \boxed{n}$	$683 + 8 = \boxed{n}$
6.	$867 + \boxed{n} = 871$	$934 + \boxed{n} = 942$	$586 = 578 + \boxed{n}$	$947 = \boxed{n} + 938$

Ⓑ				
1.	$54 + \boxed{n} = 61$	$95 = 87 + \boxed{n}$	$47 = 9 + \boxed{n}$	$68 = \boxed{n} + 59$
2.	$187 + 5 = \boxed{n}$	$356 + 8 = \boxed{n}$	$477 + 7 = \boxed{n}$	$369 + 9 = \boxed{n}$
3.	$3 + 428 = \boxed{n}$	$972 + 9 = \boxed{n}$	$8 + 367 = \boxed{n}$	$9 + 485 = \boxed{n}$
4.	$\boxed{n} = 868 + 9$	$\boxed{n} = 742 + 10$	$867 + 9 = \boxed{n}$	$3 + 239 = \boxed{n}$
5.	$\boxed{n} = 744 + 8$	$637 + 6 = \boxed{n}$	$896 + 7 = \boxed{n}$	$\boxed{n} = 988 + 5$
6.	$563 + \boxed{n} = 572$	$\boxed{n} + 638 = 647$	$892 + 9 = \boxed{n}$	$977 + \boxed{n} = 983$

CODED ANSWERS, SET 18, PART A: **1.** (a) H, (b) E, (c) EG, (d) F; **2.** (a) JEA, (b) IIB, (c) DDD, (d) CCJ; **3.** (a) IGI, (b) BCG, (c) DDJ, (d) IHJ; **4.** (a) CCI, (b) IGC, (c) EHI, (d) IGC; **5.** (a) DCA, (b) HFB, (c) FFH, (d) DFJ; **6.** (a) C, (b) E, (c) E, (d) F

Set 19 *For use after page 69*

A

	a	b	c	d	e	f	g	h	i
1.	37 +8	56 +26	87 +36	43 +9	68 +24	76 +76	58 +4	47 +17	56 +79
2.	22 +9	68 +26	85 +79	67 +5	14 +69	58 +69	59 +4	18 +79	44 +66

B

1.	26 +6	54 +29	45 +98	54 +6	37 +38	66 +78	38 +4	29 +19	38 +97
2.	73 +8	69 +25	76 +74	86 +5	48 +46	75 +99	67 +8	77 +19	89 +56

CODED ANSWERS, SET 19, PART A: 1. (a) JD, (b) GC, (c) ECH, (d) DC, (e) IC, (f) EDC, (g) AC, (h) AJ, (i) EHD; **2.** (a) HE, (b) IJ, (c) EAJ, (d) FC, (e) GH, (f) ECF, (g) AH, (h) IF, (i) EEB

Set 20 *For use after page 69*

A

	a	b	c	d	e	f	g	h
1.	326 +468	534 +259	421 +309	319 +146	573 +152	390 +469	376 +452	293 +486
2.	467 +368	379 +123	378 +147	638 +287	456 +269	289 +376	193 +537	329 +396

	a	b	c	d
3.	536 + 587 = n	947 + 589 = n	654 + 878 = n	948 + 699 = n
4.	677 + 388 = n	666 + 666 = n	385 + 769 = n	562 + 949 = n

B

1.	629 +153	406 +279	384 +455	293 +563	425 +395	157 +285	476 +389	748 +197
2.	763 +578	637 +895	666 +444	858 +564	647 +886	123 +998	746 +368	578 +839

CODED ANSWERS, SET 20, PART A: 1. (a) DFH, (b) DFC, (c) DCE, (d) HJA, (e) DIA, (f) GAF, (g) GIG, (h) DDF; **2.** (a) GCA, (b) AEI, (c) AIA, (d) FIA, (e) DIA, (f) JJA, (g) DCE, (h) DIA; **3.** (a) BBIC, (b) BACJ, (c) BACI, (d) BJHD; **4.** (a) BEJA, (b) BCCI, (c) BBAH, (d) BABB

Set 21 *For use after page 71*

Ⓐ

	a	b	c	d
1.	$54 - 3 = \boxed{n}$	$68 - 5 = \boxed{n}$	$37 - 6 = \boxed{n}$	$45 - 0 = \boxed{n}$
2.	$40 - 2 = \boxed{n}$	$20 - 4 = \boxed{n}$	$80 - 3 = \boxed{n}$	$90 - 6 = \boxed{n}$
3.	$42 - 4 = \boxed{n}$	$61 - 2 = \boxed{n}$	$32 - 3 = \boxed{n}$	$24 - 6 = \boxed{n}$
4.	$56 - 8 = \boxed{n}$	$74 - 9 = \boxed{n}$	$37 - 8 = \boxed{n}$	$22 - 7 = \boxed{n}$
5.	$67 - 8 = \boxed{n}$	$45 - 9 = \boxed{n}$	$36 - 8 = \boxed{n}$	$54 - 7 = \boxed{n}$
6.	$54 - \boxed{n} = 51$	$65 - \boxed{n} = 63$	$37 - \boxed{n} = 32$	$46 - \boxed{n} = 41$

Ⓑ

1.	$87 - 4 = \boxed{n}$	$56 - 6 = \boxed{n}$	$98 - 3 = \boxed{n}$	$66 - 5 = \boxed{n}$
2.	$60 - 1 = \boxed{n}$	$50 - 3 = \boxed{n}$	$70 - 5 = \boxed{n}$	$40 - 8 = \boxed{n}$
3.	$31 - 2 = \boxed{n}$	$73 - 5 = \boxed{n}$	$84 - 5 = \boxed{n}$	$17 - 9 = \boxed{n}$
4.	$64 - 9 = \boxed{n}$	$72 - 7 = \boxed{n}$	$43 - 6 = \boxed{n}$	$56 - 9 = \boxed{n}$
5.	$95 - 6 = \boxed{n}$	$96 - 5 = \boxed{n}$	$84 - 7 = \boxed{n}$	$76 - 7 = \boxed{n}$
6.	$47 - \boxed{n} = 42$	$56 - \boxed{n} = 50$	$65 - \boxed{n} = 64$	$78 - \boxed{n} = 78$

CODED ANSWERS, SET 21, PART A: 1. (a) DH, (b) BJ, (c) JH, (d) AD; **2.** (a) JI, (b) HB, (c) FF, (d) IA; **3.** (a) JI, (b) DG, (c) EG, (d) HI; **4.** (a) AI, (b) BD, (c) EG, (d) HD; **5.** (a) DG, (b) JB, (c) EI, (d) AF; **6.** (a) J, (b) E, (c) D, (d) D

Set 22 *For use after page 71*

Ⓐ

	a	b	c	d
1.	$56 - \boxed{n} = 49$	$42 - \boxed{n} = 38$	$73 - \boxed{n} = 67$	$85 - \boxed{n} = 76$
2.	$139 - 4 = \boxed{n}$	$537 - 6 = \boxed{n}$	$965 - 2 = \boxed{n}$	$879 - 3 = \boxed{n}$
3.	$564 - 6 = \boxed{n}$	$713 - 9 = \boxed{n}$	$675 - 7 = \boxed{n}$	$863 - 8 = \boxed{n}$
4.	$416 - \boxed{n} = 414$	$537 - \boxed{n} = 534$	$879 - \boxed{n} = 873$	$465 - \boxed{n} = 461$
5.	$586 - 9 = \boxed{n}$	$374 - \boxed{n} = 366$	$657 - 8 = \boxed{n}$	$876 - \boxed{n} = 867$
6.	$43 - 39 = \boxed{n}$	$52 - 48 = \boxed{n}$	$63 - 59 = \boxed{n}$	$86 - 78 = \boxed{n}$

Ⓑ

1.	$22 - \boxed{n} = 17$	$35 - \boxed{n} = 29$	$64 - \boxed{n} = 57$	$56 - \boxed{n} = 47$
2.	$167 - 3 = \boxed{n}$	$365 - 2 = \boxed{n}$	$977 - 5 = \boxed{n}$	$839 - 3 = \boxed{n}$
3.	$376 - 8 = \boxed{n}$	$427 - 8 = \boxed{n}$	$568 - 9 = \boxed{n}$	$327 - 7 = \boxed{n}$
4.	$236 - \boxed{n} = 230$	$329 - \boxed{n} = 322$	$465 - \boxed{n} = 465$	$827 - \boxed{n} = 821$
5.	$347 - 9 = \boxed{n}$	$763 - \boxed{n} = 756$	$465 - 7 = \boxed{n}$	$863 - \boxed{n} = 854$
6.	$32 - 29 = \boxed{n}$	$43 - 26 = \boxed{n}$	$55 - 49 = \boxed{n}$	$66 - 58 = \boxed{n}$

CODED ANSWERS, SET 22, PART A: 1. (a) C, (b) F, (c) G, (d) J; **2.** (a) EAB, (b) BAE, (c) JGA, (d) HCG; **3.** (a) BBH, (b) CDF, (c) GGH, (d) HBB; **4.** (a) I, (b) A, (c) G, (d) F; **5.** (a) BCC, (b) H, (c) GFJ, (d) J; **6.** (a) F, (b) F, (c) F, (d) H

Set 23

For use after page 73

A

	a	b	c	d	e	f	g	h	i
1.	32 −8	51 −9	36 −8	22 −5	47 −8	83 −9	91 −3	44 −7	65 −7
2.	73 −27	42 −15	75 −39	60 −54	34 −28	26 −17	58 −29	97 −68	80 −47

B

1.	30 −6	41 −8	66 −7	84 −8	40 −2	73 −4	57 −8	92 −5	32 −5
2.	53 −18	71 −42	84 −29	36 −18	97 −49	86 −29	57 −28	43 −17	94 −35
3.	82 −76	92 −66	63 −45	40 −29	81 −12	65 −39	88 −19	76 −37	57 −28

CODED ANSWERS, SET 23, PART A: 1. (a) JI, (b) IJ, (c) JG, (d) AD, (e) BE, (f) DI, (g) GG, (h) BD, (i) CG; **2.** (a) IH, (b) JD, (c) BH, (d) H, (e) H, (f) E, (g) JE, (h) JE, (i) BB

Set 24

For use after page 78

Find the difference of the amounts given and check your work.

A

	a	b	c	d	e	f	g
1.	$8.56 3.21	$7.74 4.53	$4.83 4.53	$3.90 1.30	$6.38 .24	$9.74 4.34	$5.36 1.15
2.	$6.72 1.37	$8.65 2.26	$9.44 7.19	$4.36 .84	$7.29 4.93	$6.14 .39	$5.26 2.57

B

1.	$5.81 2.30	$4.75 .21	$7.46 3.15	$6.66 4.24	$5.98 3.13	$8.72 5.72	$2.67 1.52
2.	$9.48 .19	$8.74 2.37	$5.46 2.49	$9.78 .94	$4.82 1.92	$6.34 2.87	$7.65 4.98

CODED ANSWERS, SET 24, PART A: 1. (a) H.BH, (b) B.AD, (c) .BE, (d) A.FE, (e) F.DJ, (f) H.JE, (g) J.AD; **2.** (a) H.BH, (b) F.BC, (c) A.AH, (d) B.HA, (e) A.BF, (f) H.GH, (g) A.FC

Set 25 *For use after page 78*

Find the total amount.

Ⓐ

	a	b	c	d	e	f	g
1.	\$1.36 7.54	\$4.25 3.57	\$3.44 5.39	\$5.65 .16	\$4.37 2.91	\$7.81 1.46	\$6.09 3.35
2.	\$8.34 6.79	\$4.53 .88	\$5.64 8.97	\$3.75 7.29	\$1.18 9.84	\$9.26 6.97	\$2.78 9.89

Ⓑ

1.	\$8.36 1.26	\$3.58 5.15	\$9.46 .37	\$5.61 3.09	\$6.84 2.41	\$4.72 4.92	\$3.86 3.72
2.	\$9.67 .43	\$10.83 3.59	\$14.47 2.97	\$11.63 4.88	\$8.64 5.99	\$16.27 3.86	\$17.48 1.84

CODED ANSWERS, SET 25, PART A: 1. (a) D.GB, (b) E.DJ, (c) D.DI, (d) H.DA, (e) E.JD, (f) G.JE, (g) G.CC; **2.** (a) AH.AI, (b) H.CA, (c) AC.FA, (d) AA.BC, (e) AA.BJ, (f) AF.JI, (g) AJ.FE

Set 26 *For use after page 82*

Ⓐ

	a	b	c	d	e	f	g	h
1.	123 −29	164 −77	186 −98	152 −73	285 −37	636 −58	347 −59	460 −75
2.	860 −158	356 −137	843 −539	691 −522	963 −692	707 −372	876 −481	559 −482

	a	b	c	d
3.	526 − 178 = n	646 − 249 = n	357 − 168 = n	521 − 268 = n
4.	734 − 365 = n	846 − 289 = n	447 − 138 = n	956 − 387 = n

Ⓑ

1.	153 −69	174 −89	216 −89	741 −53	580 −233	634 −126	727 −282	856 −373
2.	441 −159	672 −288	933 −797	764 −686	875 −276	586 −177	357 −258	928 −589

CODED ANSWERS, SET 26, PART A: 1. (a) FG, (b) IB, (c) II, (d) BF, (e) AGI, (f) HBI, (g) AII, (h) CIH; **2.** (a) BJA, (b) AEF, (c) CJG, (d) EDF, (e) ABE, (f) CCH, (g) CFH, (h) BB; **3.** (a) CGI, (b) CFB, (c) EIF, (d) AHC; **4.** (a) CDF, (b) HHB, (c) CJF, (d) HDF

Set 27 *For use after page 82*

Ⓐ

	a	b	c	d	e	f	g	h
1.	671 −252	362 −133	437 −242	612 −136	906 −174	751 −227	628 −192	873 −618
2.	747 −288	535 −237	496 −369	368 −179	417 −254	925 −287	735 −369	626 −448

	a	b	c	d
3.	564 − 289 = $\boxed{n}$	936 − 687 = $\boxed{n}$	852 − 496 = $\boxed{n}$	691 − 193 = $\boxed{n}$
4.	746 − 599 = $\boxed{n}$	418 − 349 = $\boxed{n}$	736 − 717 = $\boxed{n}$	874 − 495 = $\boxed{n}$

Ⓑ

1.	635 −128	524 −327	816 −348	943 −544	747 −665	932 −763	543 −297	921 −875
2.	520 −398	885 −149	730 −591	861 −762	621 −274	526 −339	772 −494	681 −568

3.	533 − 446 = $\boxed{n}$	963 − 255 = $\boxed{n}$	858 − 269 = $\boxed{n}$	896 − 317 = $\boxed{n}$
4.	722 − 348 = $\boxed{n}$	685 − 426 = $\boxed{n}$	542 − 467 = $\boxed{n}$	961 − 860 = $\boxed{n}$

CODED ANSWERS, SET 27, PART A: **1.** (a) CJF, (b) BBF, (c) JFH, (d) CGD, (e) GIB, (f) HBC, (g) CID, (h) BHH; **2.** (a) CHF, (b) BFE, (c) JBG, (d) JEF, (e) JDI, (f) DIE, (g) IDD, (h) JGE; **3.** (a) BGH, (b) BCF, (c) IHD, (d) CFE; **4.** (a) JCG, (b) DF, (c) JF, (d) IGF

Set 28 *For use after page 82*

Ⓐ

a	b	c	d	e	f	g	h
476 +59	671 −346	537 +283	528 −141	628 +177	430 +398	732 −496	974 −876

Ⓑ

1.	813 −174	516 +694	876 +427	765 −379	657 −288	837 +999	940 −333	777 +567

	a	b	c	d
2.	503 − 261 = $\boxed{n}$	765 + 879 = $\boxed{n}$	636 − 386 = $\boxed{n}$	638 + 597 = $\boxed{n}$
3.	347 − 158 = $\boxed{n}$	767 + 967 = $\boxed{n}$	294 − 195 = $\boxed{n}$	965 − 487 = $\boxed{n}$

CODED ANSWERS, SET 28, PART A: (a) DHD, (b) HCD, (c) GCB, (d) HGF, (e) GBD, (f) GCG, (g) CHA, (h) IG

Set 29 *For use after page 82*

	a	b	c	d	e	f	g	h	i	j
A	4	9	7	5	6	9	3	7	9	7
	8	5	6	9	9	9	9	8	8	9
	+9	+8	+8	+7	+8	+7	+8	+7	+6	+5
B	5	9	8	6	8	7	5	6	9	7
	7	7	8	7	9	8	8	7	9	7
	+8	+8	+8	+9	+6	+8	+9	+8	+9	+7

CODED ANSWERS, SET 29, PART A: (a) IB, (b) II, (c) IB, (d) IB, (e) IC, (f) IA, (g) IE, (h) II, (i) IC, (j) IB

Set 30 *For use after page 82*

	a	b	c	d	e	f	g	h	i	j
A	3	4	9	3	7	8	9	2	8	7
	8	6	6	7	5	6	7	3	6	6
	6	7	9	6	9	4	8	7	6	4
	+4	+9	+5	+8	+4	+2	+3	+9	+5	+8
B	4	3	6	4	7	6	4	3	9	8
	7	6	8	9	5	8	6	8	9	7
	6	5	7	3	8	3	5	9	4	7
	+8	+8	+5	+6	+4	+7	+7	+7	+9	+6

CODED ANSWERS, SET 30, PART A: (a) EH, (b) EB, (c) EG, (d) EA, (e) ED, (f) EC, (g) EF, (h) EH, (i) ED, (j) ED

Set 31 *For use after page 82*

	a	b	c	d	e	f	g	h	i
A	23	17	46	35	59	70	59	68	77
	35	36	29	48	48	49	36	48	88
	+14	+24	+24	+62	+61	+67	+17	+97	+99
B	30	25	18	63	56	64	52	48	99
	57	39	27	29	74	39	87	67	79
	+14	+35	+43	+38	+58	+65	+36	+87	+96

CODED ANSWERS, SET 31, PART A: (a) CI, (b) CC, (c) JJ, (d) EFB, (e) EGH, (f) EHG,(g) EEI, (h) IEA, (i) IGF

Set 32 *For use after page 82*

Ⓐ	a	b	c	d	e	f	g	h	i
1.	23 5 +7	4 17 +6	5 6 +18	34 9 +6	25 17 +5	34 6 +29	7 16 +53	42 29 +6	54 9 +26
2.	15 49 +12	34 53 +54	43 82 +76	51 68 +94	26 70 +57	67 26 +68	73 83 +95	82 37 +94	91 28 +19
3.	19 99 +16	19 76 +85	28 23 +57	73 54 +48	23 45 +26	49 18 +54	67 66 +75	38 43 +79	81 67 +23

Ⓑ									
1.	18 +5	9 +12	41 +5	67 +8	63 +7	43 +29	6 +68	37 +8	37 +5
2.	92 58 +46	90 17 +53	18 43 +76	37 90 +82	54 78 +97	69 54 +62	38 73 +26	54 12 +49	67 80 +51
3.	97 89 +75	46 95 +83	29 63 +81	76 25 +43	78 97 +68	76 44 +58	19 65 +37	54 18 +92	67 58 +54

CODED ANSWERS, SET 32, PART A: 1. (a) BC, (b) JD, (c) JE, (d) IE, (e) ID, (f) HE, (g) DH, (h) DD, (i) GE; **2.** (a) DH, (b) AIA, (c) JFA, (d) JAB, (e) ACB, (f) AHA, (g) JCA, (h) JAB, (i) ABG; **3.** (a) ABI, (b) AGF, (c) AFG, (d) ADC, (e) EI, (f) AJA, (g) JFG, (h) AHF, (i) ADA

Set 33 *For use after page 82*

Ⓐ	a	b	c
1.	$25 + 6 + 3 = \boxed{n}$	$36 + 9 + 24 = \boxed{n}$	$64 + 32 + 7 = \boxed{n}$
2.	$324 + 6 + 25 = \boxed{n}$	$953 + 7 + 46 = \boxed{n}$	$6 + 707 + 46 = \boxed{n}$

Ⓑ			
1.	$43 + 8 + 7 = \boxed{n}$	$27 + 8 + 53 = \boxed{n}$	$75 + 67 + 8 = \boxed{n}$
2.	$614 + 9 + 32 = \boxed{n}$	$876 + 9 + 28 = \boxed{n}$	$7 + 808 + 59 = \boxed{n}$

CODED ANSWERS, SET 33, PART A: 1. (a) BJ, (b) FC, (c) DEB; **2.** (a) BHH, (b) DEEF, (c) GHC

Set 34 *For use after page 82*

Copy the problems. Write the missing digits instead of the ▥.

	a	b	c	d	e	f	g	h	i
1.	23 +▥6 69	▥4 −22 42	▥6 +3▥ 88	6▥ +▥5 89	8▥ −▥3 36	49 +▥▥ 89	▥9 −18 71	▥▥ −12 80	22 +▥▥ 69
2.	36 +2▥ ▥2	▥7 +13 6▥	▥9 −2▥ 26	32 −▥▥ 14	4▥ +▥5 89	85 −▥▥ 55	▥▥ −36 14	6▥ +▥9 92	4▥ −▥3 6
3.	5▥ +▥2 115	▥▥ −17 26	▥4 +7▥ 159	5▥ −13 ▥7	▥8 −8▥ 9	1▥ +94 1▥7	36 +▥▥ 135	6▥ −▥9 28	▥▥ +89 165

Set 35 *For use after page 82*

Copy the problems. Write the missing digits instead of the ▥.

	a	b	c	d	e	f	g	h
1.	11▥ −54 ▥2	3▥2 +▥3▥ 879	▥▥▥ +315 999	▥▥6 −7▥ 75	146 +▥▥▥ 648	63▥ +▥1 ▥58	1▥▥ −82 96	▥▥▥ −73 96
2.	7▥5 −▥2▥ 342	586 −▥▥▥ 445	▥3▥ +3▥2 788	8▥7 −▥2▥ 556	7▥▥ −▥42 47	8▥▥ +▥57 1489	▥96 +▥▥ 263	47▥ −▥4 ▥65
3.	15▥ +7▥7 893	377 −26▥ 1▥9	▥6▥ −138 722	23▥ +6▥9 883	▥32 −39▥ 140	282 +▥▥4 876	8▥2 +▥90 1042	▥53 +6▥5 928
4.	92▥ +▥78 11▥1	94▥ +▥▥9 1284	▥39 −46▥ 477	8▥▥ +▥94 1574	7▥3 −32▥ 434	7▥7 +▥64 1301	4▥2 −▥6▥ 17	▥67 +84▥ 1413

Set 36 *For use after page 82*

A

	a	b	c
1.	$54 + 6 + 3 = \boxed{n}$	$8 + 57 + 9 = \boxed{n}$	$6 + 27 + 8 = \boxed{n}$
2.	$34 + 9 + 43 = \boxed{n}$	$35 + 6 + 59 = \boxed{n}$	$86 + 27 + 4 = \boxed{n}$
3.	$465 + 7 + 9 = \boxed{n}$	$8 + 362 + 6 = \boxed{n}$	$9 + 8 + 274 = \boxed{n}$
4.	$367 + 5 + 26 = \boxed{n}$	$8 + 293 + 56 = \boxed{n}$	$93 + 4 + 389 = \boxed{n}$
5.	$536 + 24 + 56 = \boxed{n}$	$9 + 397 + 4 = \boxed{n}$	$413 + 657 + 28 = \boxed{n}$
6.	$5 + 29 + 34 + 7 = \boxed{n}$	$4 + 93 + 467 + 8 = \boxed{n}$	$398 + 7 + 29 + 48 = \boxed{n}$

B

1.	$66 + 4 + 5 = \boxed{n}$	$7 + 63 + 9 = \boxed{n}$	$4 + 38 + 6 = \boxed{n}$
2.	$57 + 4 + 36 = \boxed{n}$	$42 + 9 + 63 = \boxed{n}$	$97 + 31 + 8 = \boxed{n}$
3.	$576 + 8 + 5 = \boxed{n}$	$5 + 639 + 7 = \boxed{n}$	$8 + 8 + 685 = \boxed{n}$
4.	$346 + 7 + 34 = \boxed{n}$	$6 + 647 + 39 = \boxed{n}$	$47 + 5 + 366 = \boxed{n}$
5.	$654 + 32 + 91 = \boxed{n}$	$8 + 466 + 37 = \boxed{n}$	$416 + 879 + 34 = \boxed{n}$
6.	$5 + 42 + 39 + 3 = \boxed{n}$	$7 + 84 + 328 + 6 = \boxed{n}$	$347 + 6 + 38 + 52 = \boxed{n}$

CODED ANSWERS, SET 36, PART A: 1. (a) FI, (b) EC, (c) CA; **2.** (a) DF, (b) ABB, (c) AAE; **3.** (a) CDA, (b) IEF, (c) JGA; **4.** (a) IGD, (b) IHE, (c) CDF; **5.** (a) FAF, (b) CAB, (c) ABGD; **6.** (a) EH, (b) HEJ, (c) CDJ

Set 37 *For use after page 82*

A

	a	b	c	d	e	f	g	h
1.	$\begin{array}{r}72\\+65\\\hline\end{array}$	$\begin{array}{r}90\\+47\\\hline\end{array}$	$\begin{array}{r}63\\-23\\\hline\end{array}$	$\begin{array}{r}57\\+84\\\hline\end{array}$	$\begin{array}{r}96\\-37\\\hline\end{array}$	$\begin{array}{r}453\\+236\\\hline\end{array}$	$\begin{array}{r}613\\-252\\\hline\end{array}$	$\begin{array}{r}530\\-224\\\hline\end{array}$
2.	$\begin{array}{r}513\\+888\\\hline\end{array}$	$\begin{array}{r}416\\-126\\\hline\end{array}$	$\begin{array}{r}780\\+57\\\hline\end{array}$	$\begin{array}{r}32\\+499\\\hline\end{array}$	$\begin{array}{r}653\\-283\\\hline\end{array}$	$\begin{array}{r}716\\+24\\\hline\end{array}$	$\begin{array}{r}876\\+347\\\hline\end{array}$	$\begin{array}{r}924\\-676\\\hline\end{array}$

B

1.	$\begin{array}{r}64\\+36\\\hline\end{array}$	$\begin{array}{r}79\\-48\\\hline\end{array}$	$\begin{array}{r}83\\+49\\\hline\end{array}$	$\begin{array}{r}117\\-28\\\hline\end{array}$	$\begin{array}{r}356\\+241\\\hline\end{array}$	$\begin{array}{r}572\\-148\\\hline\end{array}$	$\begin{array}{r}629\\-598\\\hline\end{array}$	$\begin{array}{r}340\\+960\\\hline\end{array}$
2.	$\begin{array}{r}823\\+799\\\hline\end{array}$	$\begin{array}{r}962\\-897\\\hline\end{array}$	$\begin{array}{r}430\\+980\\\hline\end{array}$	$\begin{array}{r}651\\-279\\\hline\end{array}$	$\begin{array}{r}365\\+376\\\hline\end{array}$	$\begin{array}{r}888\\-499\\\hline\end{array}$	$\begin{array}{r}777\\+666\\\hline\end{array}$	$\begin{array}{r}367\\-276\\\hline\end{array}$

CODED ANSWERS, SET 37, PART A: 1. (a) ECB, (b) ECB, (c) GJ, (d) EGE, (e) HF, (f) DIF, (g) CDE, (h) CJD; **2.** (a) EGJE, (b) AFJ, (c) ICB, (d) HCE, (e) CBJ, (f) BGJ, (g) EAAC, (h) AGI

Set 38 *For use after page 115*

	a	b	c	d	e	f
1.	2×1	2×2	3×3	3×4	4×0	4×1
2.	4×3	5×5	4×4	6×6	8×7	8×9
3.	4×5	9×0	1×8	3×2	3×5	3×6
4.	5×3	6×5	4×6	7×6	9×1	9×7
5.	1×3	4×2	0×0	2×9	6×3	4×7
6.	7×3	3×7	7×5	7×7	1×1	5×2
7.	6×2	8×1	8×3	0×3	8×5	9×9
8.	4×8	6×9	1×9	7×9	9×8	9×3
9.	2×8	7×2	6×8	4×9	5×0	7×8
10.	0×6	5×4	5×1	1×5	8×2	2×7
11.	6×4	2×6	6×7	5×6	3×8	1×4
12.	3×1	2×5	9×2	1×2	7×4	5×7
13.	8×4	0×8	3×9	5×8	9×6	6×1
14.	1×7	8×6	1×6	0×1	8×8	9×5
15.	5×9	7×1	2×4	9×4	2×3	7×0

Set 39 *For use after page 118*

Ⓐ

	a	b	c	d
1.	$9 \times 6 = \boxed{n}$	$5 \times \boxed{n} = 35$	$\boxed{n} \times 4 = 28$	$\boxed{n} \times 5 = 0$
2.	$56 = 7 \times \boxed{n}$	$6 \times \boxed{n} = 24$	$\boxed{n} \times 8 = 32$	$9 \times \boxed{n} = 36$
3.	$8 \times \boxed{n} = 8$	$\boxed{n} \times 3 = 21$	$4 \times \boxed{n} = 20$	$30 = 6 \times \boxed{n}$
4.	$72 = 8 \times \boxed{n}$	$56 = \boxed{n} \times 8$	$\boxed{n} \times 9 = 63$	$7 \times \boxed{n} = 49$

Ⓑ

1.	$8 \times \boxed{n} = 40$	$7 \times 6 = \boxed{n}$	$30 = 5 \times \boxed{n}$	$\boxed{n} \times 7 = 28$
2.	$\boxed{n} \times 5 = 25$	$21 = 7 \times \boxed{n}$	$24 = \boxed{n} \times 6$	$\boxed{n} \times 8 = 64$
3.	$9 \times \boxed{n} = 72$	$\boxed{n} \times 9 = 54$	$48 = \boxed{n} \times 6$	$7 \times \boxed{n} = 42$
4.	$35 = 7 \times \boxed{n}$	$8 \times \boxed{n} = 0$	$\boxed{n} \times 9 = 45$	$24 = 3 \times \boxed{n}$

CODED ANSWERS, SET 39, PART A: **1.** (a) CI, (b) D, (c) D, (d) F; **2.** (a) G, (b) I, (c) I, (d) I; **3.** (a) A, (b) D, (c) C, (d) C; **4.** (a) E, (b) D, (c) D, (d) D

Set 40 *For use after page 156*

	a	b	c	d	e	f
1.	4 ÷ 2	9 ÷ 3	1 ÷ 1	2 ÷ 2	6 ÷ 3	16 ÷ 4
2.	12 ÷ 3	25 ÷ 5	20 ÷ 5	6 ÷ 2	2 ÷ 1	42 ÷ 6
3.	20 ÷ 4	15 ÷ 3	0 ÷ 1	24 ÷ 6	36 ÷ 6	8 ÷ 2
4.	10 ÷ 2	3 ÷ 1	48 ÷ 8	18 ÷ 3	27 ÷ 9	3 ÷ 3
5.	24 ÷ 4	54 ÷ 9	21 ÷ 3	12 ÷ 2	49 ÷ 7	48 ÷ 6
6.	24 ÷ 8	42 ÷ 7	28 ÷ 7	4 ÷ 1	24 ÷ 3	32 ÷ 8
7.	35 ÷ 5	18 ÷ 9	0 ÷ 9	56 ÷ 7	28 ÷ 4	8 ÷ 8
8.	9 ÷ 1	14 ÷ 2	4 ÷ 4	54 ÷ 6	21 ÷ 7	63 ÷ 7
9.	63 ÷ 9	32 ÷ 4	40 ÷ 5	16 ÷ 2	56 ÷ 8	45 ÷ 9
10.	18 ÷ 2	6 ÷ 6	8 ÷ 1	40 ÷ 8	18 ÷ 6	16 ÷ 8
11.	64 ÷ 8	35 ÷ 7	36 ÷ 4	14 ÷ 7	5 ÷ 5	7 ÷ 1
12.	15 ÷ 5	72 ÷ 8	12 ÷ 6	0 ÷ 5	30 ÷ 5	45 ÷ 5
13.	30 ÷ 6	6 ÷ 1	72 ÷ 9	36 ÷ 9	10 ÷ 5	27 ÷ 3
14.	12 ÷ 4	7 ÷ 7	81 ÷ 9	8 ÷ 4	5 ÷ 1	9 ÷ 9

Set 41 *For use after page 156*

A

	a	b	c	d
1.	$27 \div 3 = \boxed{n}$	$48 \div \boxed{n} = 6$	$\boxed{n} \div 4 = 4$	$72 \div 8 = \boxed{n}$
2.	$\boxed{n} = 63 \div 7$	$48 \div 8 = \boxed{n}$	$32 \div \boxed{n} = 4$	$\boxed{n} \div 9 = 5$
3.	$\boxed{n} \div 7 = 7$	$54 \div \boxed{n} = 6$	$7 = \boxed{n} \div 3$	$72 \div \boxed{n} = 8$
4.	$3 = 21 \div \boxed{n}$	$81 \div \boxed{n} = 9$	$40 \div 8 = \boxed{n}$	$\boxed{n} \div 7 = 3$

B

1.	$20 \div 4 = \boxed{n}$	$\boxed{n} = 42 \div 6$	$\boxed{n} \div 6 = 4$	$72 \div \boxed{n} = 9$
2.	$\boxed{n} = 36 \div 4$	$\boxed{n} \div 3 = 8$	$30 \div \boxed{n} = 6$	$40 \div \boxed{n} = 5$
3.	$5 = 15 \div \boxed{n}$	$\boxed{n} \div 8 = 0$	$42 \div 7 = \boxed{n}$	$9 \div \boxed{n} = 9$
4.	$56 \div 8 = \boxed{n}$	$\boxed{n} = 24 \div 4$	$28 \div \boxed{n} = 4$	$\boxed{n} \div 3 = 4$
5.	$48 \div \boxed{n} = 8$	$81 \div \boxed{n} = 9$	$\boxed{n} = 63 \div 9$	$\boxed{n} \div 6 = 9$

CODED ANSWERS, SET 41, PART A: **1.** (a) E, (b) G, (c) AH, (d) E; **2.** (a) E, (b) H, (c) G, (d) IC; **3.** (a) IE, (b) E, (c) JA, (d) E; **4.** (a) D, (b) E, (c) C, (d) JA

Set 42 *For use after page 211*

Ⓐ	a	b	c	d	e	f
1.	10 × 10	8 × 10	10 × 7	6 × 10	10 × 4	5 × 10
2.	0 × 10	3 × 10	12 × 10	15 × 10	10 × 18	10 × 17
3.	23 × 10	10 × 61	34 × 10	52 × 10	65 × 10	10 × 39
4.	20 × 10	53 × 10	10 × 81	40 × 10	10 × 80	85 × 10
5.	38 × 100	41 × 100	56 × 100	65 × 100	100 × 73	89 × 100

Ⓑ						
1.	9 × 10	7 × 10	10 × 8	10 × 0	2 × 10	10 × 5
2.	10 × 6	1 × 10	14 × 10	10 × 16	19 × 10	13 × 10
3.	32 × 10	10 × 58	36 × 10	58 × 10	76 × 10	10 × 57
4.	40 × 10	62 × 10	10 × 93	80 × 10	10 × 30	93 × 10
5.	39 × 100	53 × 100	67 × 100	100 × 27	43 × 100	78 × 100

CODED ANSWERS, SET 42, PART A: 1. (a) JAA, (b) EA, (c) GA, (d) DA, (e) CA, (f) HA; **2.** (a) A, (b) IA, (c) JBA, (d) JHA, (e) JEA, (f) JGA; **3.** (a) BIA, (b) DJA, (c) ICA, (d) HBA, (e) DHA, (f) IFA; **4.** (a) BAA, (b) HIA, (c) EJA, (d) CAA, (e) EAA, (f) EHA; **5.** (a) IEAA, (b) CJAA, (c) HDAA, (d) DHAA, (e) GIAA, (f) EFAA

Set 43 *For use after page 212*

Ⓐ	a	b	c	d	e
1.	3 × 40	60 × 4	50 × 9	8 × 70	2 × 30
2.	8 × 50	20 × 9	7 × 30	4 × 80	50 × 6
3.	9 × 90	4 × 70	80 × 6	60 × 6	8 × 60
4.	7 × 70	80 × 8	90 × 6	7 × 90	90 × 7
5.	275 × 10	10 × 832	653 × 10	10 × 976	8345 × 10
6.	8 × 100	100 × 9	18 × 100	100 × 34	100 × 76

Ⓑ					
1.	4 × 50	70 × 3	60 × 8	7 × 90	3 × 20
2.	7 × 60	30 × 9	6 × 30	5 × 80	6 × 60
3.	8 × 90	5 × 60	70 × 8	80 × 7	4 × 90
4.	7 × 30	90 × 5	60 × 9	90 × 6	90 × 9
5.	343 × 10	10 × 976	729 × 10	10 × 834	7638 × 10
6.	6 × 100	100 × 4	13 × 100	71 × 100	100 × 57

CODED ANSWERS, SET 43, PART A: 1. (a) ECB, (b) CJB, (c) JDB, (d) DAB, (e) AB; **2.** (a) JBB, (b) EGB, (c) CEB, (d) HCB, (e) HBB; **3.** (a) GEB, (b) CGB, (c) JGB, (d) HAB, (e) JGB; **4.** (a) JIB, (b) AJB, (c) DJB, (d) AHB, (e) AHB; **5.** (a) CFDB, (b) GHCB, (c) ADHB, (d) IFAB, (e) GHJDB; **6.** (a) GBB, (b) IBB, (c) EGBB, (d) HJBB, (e) FABB

Set 44 *For use after page 226*

Ⓐ	a	b	c	d	e	f	g	h	i
1.	13 ×4	16 ×2	22 ×4	11 ×3	22 ×5	53 ×4	43 ×6	51 ×3	24 ×7
2.	13 ×3	32 ×5	34 ×4	45 ×2	67 ×7	81 ×6	60 ×5	79 ×8	85 ×9

Ⓑ									
1.	19 ×2	62 ×4	35 ×3	41 ×4	28 ×5	37 ×3	32 ×2	16 ×4	45 ×5
2.	29 ×6	43 ×7	78 ×3	65 ×8	56 ×2	43 ×9	27 ×4	81 ×5	90 ×3
3.	53 ×5	45 ×4	76 ×6	98 ×3	21 ×9	79 ×2	84 ×4	52 ×7	63 ×8

CODED ANSWERS, SET 44, PART A: 1. (a) AI, (b) CI, (c) GG, (d) CC, (e) BBE, (f) IBI, (g) IAG, (h) BAC, (i) BJG; **2.** (a) CF, (b) BJE, (c) BCJ, (d) FE, (e) HJF, (f) HGJ, (g) CEE, (h) JCI, (i) DJA

Set 45 *For use after page 234*

Ⓐ	a	b	c	d	e	f	g	h
1.	123 ×2	564 ×3	345 ×4	153 ×5	254 ×6	416 ×4	325 ×3	513 ×5
2.	243 ×3	563 ×5	674 ×7	755 ×2	486 ×9	327 ×8	908 ×6	219 ×4

Ⓑ								
1.	413 ×3	525 ×2	334 ×4	242 ×5	453 ×3	264 ×2	151 ×4	640 ×5
2.	563 ×9	652 ×3	741 ×6	835 ×8	496 ×7	347 ×4	528 ×5	679 ×5

CODED ANSWERS, SET 45, PART A: 1. (a) EAB, (b) HBGE, (c) HJIC, (d) FBD, (e) HDEA, (f) HBBA, (g) GFD, (h) EDBD; **2.** (a) FEG, (b) EIHD, (c) AFHI, (d) HDHC, (e) AJFA, (f) EBHB, (g) DAAI, (h) IFB

Set 46 *For use after page 236*

Ⓐ	a	b	c	d	e	f
1.	1542 ×2	3361 ×3	5782 ×5	7954 ×3	8321 ×4	6765 ×6
2.	1738 ×3	2138 ×5	3279 ×6	4960 ×9	6851 ×7	5742 ×4
Ⓑ	4189 ×5	7498 ×6	5276 ×7	1556 ×8	2377 ×9	3648 ×4

CODED ANSWERS, SET 46, PART A: **1.** (a) ADHF, (b) EDDHA, (c) IHJED, (d) IAHGI, (e) AAIHF, (f) FDBJD; **2.** (a) BIEF, (b) EDGJD, (c) EJGCF, (d) FFGFD, (e) FCJBC, (f) IIJGH

Set 47 *For use after page 241*

Ⓐ	a	b	c	d	e	f	g	h	i
1.	16 ×12	22 ×24	74 ×36	43 ×32	58 ×14	36 ×25	45 ×31	67 ×42	57 ×35
2.	76 ×12	92 ×32	71 ×45	39 ×67	28 ×89	48 ×91	93 ×72	98 ×69	51 ×78
Ⓑ	23 ×14	16 ×12	54 ×32	92 ×56	87 ×34	67 ×37	48 ×45	25 ×64	36 ×13

CODED ANSWERS, SET 47, PART A: **1.** (a) AEJ, (b) CJG, (c) JHHI, (d) ABDH, (e) GAJ, (f) EFF, (g) ABEC, (h) JGAI, (i) AEEC; **2.** (a) EAJ, (b) JEII, (c) BAEC, (d) JHAB, (e) JIEJ, (f) IBHG, (g) HHEH, (h) HDHJ, (i) BEDG

Set 48 *For use after page 257*

Ⓐ	a	b	c	d	e
1.	560 ÷ 10	240 ÷ 8	350 ÷ 7	720 ÷ 9	630 ÷ 7
2.	3600 ÷ 4	4200 ÷ 100	4800 ÷ 6	2800 ÷ 7	2100 ÷ 3
Ⓑ					
1.	330 ÷ 10	180 ÷ 9	450 ÷ 9	560 ÷ 7	540 ÷ 9
2.	2400 ÷ 6	3800 ÷ 100	4200 ÷ 7	2700 ÷ 9	4900 ÷ 7

CODED ANSWERS, SET 48, PART A: **1.** (a) HF, (b) BE, (c) HE, (d) IE, (e) CE; **2.** (a) CEE, (b) JA, (c) IEE, (d) JEE, (e) GEE

Set 49 *For use after page 273*

Ⓐ

	a	b	c	d	e	f
1.	$2\overline{)24}$	$3\overline{)63}$	$4\overline{)48}$	$5\overline{)60}$	$6\overline{)72}$	$7\overline{)91}$
2.	$3\overline{)78}$	$5\overline{)75}$	$7\overline{)98}$	$6\overline{)78}$	$8\overline{)96}$	$9\overline{)108}$
3.	$2\overline{)108}$	$4\overline{)92}$	$6\overline{)204}$	$7\overline{)301}$	$9\overline{)585}$	$5\overline{)415}$
4.	$5\overline{)470}$	$3\overline{)222}$	$2\overline{)134}$	$8\overline{)368}$	$6\overline{)342}$	$4\overline{)384}$

Ⓑ

1.	$4\overline{)52}$	$2\overline{)32}$	$3\overline{)48}$	$6\overline{)96}$	$7\overline{)84}$	$5\overline{)80}$
2.	$7\overline{)112}$	$8\overline{)176}$	$9\overline{)207}$	$4\overline{)144}$	$2\overline{)88}$	$3\overline{)138}$
3.	$3\overline{)171}$	$4\overline{)272}$	$5\overline{)235}$	$6\overline{)564}$	$5\overline{)445}$	$4\overline{)308}$
4.	$7\overline{)385}$	$8\overline{)752}$	$6\overline{)588}$	$7\overline{)483}$	$8\overline{)312}$	$9\overline{)666}$

CODED ANSWERS, SET 49, PART A: **1.** (a) AJ, (b) JA, (c) AJ, (d) AJ, (e) AJ, (f) AI; **2.** (a) JF, (b) AH, (c) AC, (d) AI, (e) AJ, (f) AJ; **3.** (a) HC, (b) JI, (c) IC, (d) CI, (e) FH, (f) DI; **4.** (a) GC, (b) EC, (c) FE, (d) CF, (e) HE, (f) GF

Set 50 *For use after page 279*

Find the quotients and remainders.

Ⓐ

	a	b	c	d	e	f
1.	$2\overline{)57}$	$3\overline{)46}$	$5\overline{)82}$	$4\overline{)77}$	$7\overline{)98}$	$6\overline{)86}$
2.	$5\overline{)142}$	$7\overline{)35}$	$2\overline{)163}$	$3\overline{)274}$	$5\overline{)385}$	$7\overline{)496}$
3.	$8\overline{)572}$	$6\overline{)189}$	$2\overline{)138}$	$3\overline{)249}$	$4\overline{)354}$	$9\overline{)665}$
4.	$2\overline{)187}$	$6\overline{)496}$	$6\overline{)576}$	$4\overline{)284}$	$8\overline{)791}$	$9\overline{)823}$

Ⓑ

1.	$2\overline{)69}$	$3\overline{)92}$	$4\overline{)58}$	$5\overline{)76}$	$6\overline{)69}$	$7\overline{)87}$
2.	$5\overline{)235}$	$2\overline{)146}$	$5\overline{)478}$	$6\overline{)379}$	$7\overline{)598}$	$4\overline{)192}$
3.	$3\overline{)163}$	$6\overline{)475}$	$3\overline{)286}$	$4\overline{)379}$	$4\overline{)281}$	$2\overline{)192}$
4.	$9\overline{)654}$	$7\overline{)463}$	$8\overline{)355}$	$3\overline{)264}$	$8\overline{)789}$	$9\overline{)237}$

CODED ANSWERS, SET 50, PART A: (*r* stands for remainder) **1.** (a) AI*r*E, (b) EH*r*E, (c) ED*r*A, (d) EF*r*E, (e) EG*r*J, (f) EG*r*A; **2.** (a) AI*r*A, (b) H*r*J, (c) IE*r*E, (d) FE*r*E, (e) BB*r*J, (f) BJ*r*D; **3.** (a) BE*r*G, (b) CE*r*C, (c) DF*r*J, (d) IC*r*J, (e) II*r*A, (f) BC*r*I; **4.** (a) FC*r*E, (b) IA*r*G, (c) FD*r*J, (d) BE*r*J, (e) FI*r*B, (f) FE*r*G

Set 51 *For use after page 285*

A

	a	b	c
1.	$15 + \boxed{n} = 22$	$24 + 7 + 5 = \boxed{n}$	$37 - 9 = \boxed{n}$
2.	$78 \div 6 = \boxed{n}$	$16 \times 4 = \boxed{n}$	$24 - \boxed{n} = 16$
3.	$25 + 38 = \boxed{n}$	$57 - 29 = \boxed{n}$	$8 + 7 + 9 + 4 = \boxed{n}$
4.	$136 \div 4 = \boxed{n}$	$27 \times 6 = \boxed{n}$	$5 \times 93 = \boxed{n}$
5.	$376 - 29 = \boxed{n}$	$216 \div 6 = \boxed{n}$	$875 + 49 = \boxed{n}$
6.	$324 \times 7 = \boxed{n}$	$\boxed{n} = 572 - 96$	$216 \div 8 = \boxed{n}$

B

1.	$24 + \boxed{n} = 32$	$6 + 37 + 4 = \boxed{n}$	$86 - 8 = \boxed{n}$
2.	$132 \div 4 = \boxed{n}$	$27 \times 4 = \boxed{n}$	$56 - \boxed{n} = 48$
3.	$87 + 93 = \boxed{n}$	$73 - 49 = \boxed{n}$	$6 + 9 + 4 + 7 = \boxed{n}$
4.	$258 \div 6 = \boxed{n}$	$63 \times 9 = \boxed{n}$	$6 \times 87 = \boxed{n}$
5.	$854 - 57 = \boxed{n}$	$456 \div 8 = \boxed{n}$	$686 + 37 = \boxed{n}$
6.	$636 \times 5 = \boxed{n}$	$342 \div 9 = \boxed{n}$	$\boxed{n} = 431 - 289$

CODED ANSWERS, SET 51, PART A: 1.(a) G, (b) ID, (c) BE; **2.** (a) JI, (b) DC, (c) E; **3.** (a) DI, (b) BE, (c) BE; **4.** (a) IC, (b) JDB, (c) CDH; **5.** (a) ICG, (b) ID, (c) FBC; **6.** (a) BBDE, (b) CGD, (c) BG

Set 52 *For use after page 285*

A

	a	b	c	d	e	f
1.	$\begin{array}{r}365\\+478\\\hline\end{array}$	$\begin{array}{r}654\\-276\\\hline\end{array}$	$9\overline{)477}$	$\begin{array}{r}364\\\times 7\\\hline\end{array}$	$7\overline{)448}$	$\begin{array}{r}719\\-263\\\hline\end{array}$
2.	$\begin{array}{r}846\\\times 5\\\hline\end{array}$	$\begin{array}{r}923\\-357\\\hline\end{array}$	$8\overline{)596}$	$\begin{array}{r}539\\+885\\\hline\end{array}$	$9\overline{)396}$	$\begin{array}{r}396\\\times 6\\\hline\end{array}$

B

1.	$\begin{array}{r}790\\-377\\\hline\end{array}$	$\begin{array}{r}466\\\times 8\\\hline\end{array}$	$6\overline{)564}$	$\begin{array}{r}927\\+878\\\hline\end{array}$	$4\overline{)373}$	$\begin{array}{r}832\\-578\\\hline\end{array}$
2.	$\begin{array}{r}379\\\times 3\\\hline\end{array}$	$\begin{array}{r}394\\+934\\\hline\end{array}$	$8\overline{)440}$	$\begin{array}{r}971\\-796\\\hline\end{array}$	$3\overline{)261}$	$\begin{array}{r}356\\\times 8\\\hline\end{array}$

CODED ANSWERS, SET 52, PART A: (*r* stands for remainder) **1.** (a) GJH, (b) HFG, (c) DH, (d) CDJG, (e) AJ, (f) JDA; **2.** (a) JCHB, (b) DAA, (c) FJ*r*J, (d) EJCJ, (e) JJ, (f) CHFA

Tables of Measures

LENGTH	
English System	Metric System
12 inches (in.) = 1 foot (ft)	10 centimeters (cm) = 1 decimeter (dm)
3 feet = 1 yard (yd)	10 decimeters = 1 meter (m)
5280 feet = 1 mile (mi)	1000 meters = 1 kilometer (km)
1760 yards = 1 mile	

TIME	
60 seconds (sec) = 1 minute (min)	52 weeks = 1 year (yr)
60 minutes = 1 hour (hr)	12 months (mo) = 1 year
24 hours = 1 day	365 days = 1 year
7 days = 1 week (wk)	366 days = 1 leap year

LIQUID	DRY
8 fluid ounces (oz) = 1 cup	2 pints = 1 quart
2 cups = 1 pint (pt)	8 quarts = 1 peck (pk)
2 pints = 1 quart (qt)	4 pecks = 1 bushel (bu)
4 quarts = 1 gallon (gal)	

WEIGHT	
English System	Metric System
16 ounces (oz) = 1 pound (lb)	1000 grams (g) = 1 kilogram (kg)
2000 pounds = 1 ton	1000 kilograms = 1 metric ton

BOOKS TO EXPLORE

Adler, Irving. *The Giant Golden Book of Mathematics.* New York, Golden Press, 1960.

Have you ever wondered how a tree grows or why a volcano is shaped as it is or what makes a card trick work? This colorful book answers these and many other questions, through exploring the world of mathematics. You'll find all kinds of exciting ideas about numbers and what they mean in our daily lives. Here are just a few of the interesting topics:

How the Mayan Indians wrote 100	13
The puzzle of the King's reward	21
Bridges, planets and whispering galleries	54
Why a navigator needs a clock	62
A magical card trick	81

Brindze, Ruth. *The Story of Our Calendar.* New York, Vanguard, 1949.

Men did not always have calendars to tell what day of the month it was. In fact, they did not always know about months. It took thousands of years to develop the calendar as we know it, and each version presented new problems. This book tells you:

The difference between sun years and moon years	8
Who decreed the first leap year	36
How the word "calendar" was invented	40
The year the calendar was set back 11 whole days	47

Carona, Philip. *Things That Measure.* Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1962.

Many pictures and diagrams help the author tell you about different ways to measure things. He covers a wide range of subjects, including:

A unit called the cubit	13
Using tobacco for money	15
What is measured on a jeweler's stick	26
Who invented the first watch	47
Weather instruments	50–55

Hogben, Lancelot. *The Wonderful World of Mathematics.* Garden City, New York, Garden City Books, 1955.

This book shows that the story of man becoming civilized is also the story of the growth of mathematics as a science. You will enjoy going back to the time of the cave man and finding out how man learned to measure and to count, to build and to navigate, to design and to calculate with computers.

Some enjoyable things in this book are:

How plumb lines helped build pyramids	14
The Hindu number for nothing	44
Galileo's pendulum clock	53
Why horses measure power	63
A mathematical time line	68–69

Smith, George O. *Mathematics: The Language of Science.* New York, G. P. Putnam's Sons, 1961.

Interesting stories show how mathematical language is a handy tool for scientists. You will learn how the first men kept track of their possessions, how Roman businessmen struggled with Roman numerals, how the Babylonians discovered place value, and how Copernicus had trouble convincing people that the sun was the center of the universe.

Other stories you might enjoy reading in this book are:

Score means scratch mark	12
The discovery of nothing	23
Square numbers	31
Mr. Newton's apple	47–49
Investigating a Mobius strip	63–64

Some shorter books to look for in your library are listed below.

Adler, Irving and Ruth. *Numbers Old and New.* New York, John Day, 1960.

This book explains the counting methods of Australian natives and Mayan Indians, and the fractions used by Egyptians and Greeks. For fun, read the chapters about lucky and unlucky numbers, number tricks, and numbers in nature.

Auerbach, Marjorie. *Seven Uncles Come To Dinner.* New York, Alfred A. Knopf, 1963.

This is a funny story book about Emile and his shopping trip to buy things for his seven uncles.

Bendick, Jeanne. *First Book of Time.* New York, Watts, 1963.

Excellent pictures help tell the story of time and how to measure it. All kinds of clocks are described—from sun dials and water clocks to the atomic clock and clocks in your body.

Bendick, Jeanne, and Levin, Marcia O. *Take a Number.* New York, Whittlesey House, 1961.

Stories and puzzles explain different ways of counting with numbers. Some are very easy, like counting on your fingers; others are more complicated, like using a computer.

Bishop, Claire. *Twenty-two Bears.* New York, Viking, 1964.
This clever story about bears that come from everywhere is fun to read. The funny pictures help you see groups from 1 to 22.

Friskey, Margaret. *Mystery of the Farmer's Three Fives.* Chicago, Children's Press, 1963.
A book about animals that compares groups in the barnyard. You'll enjoy the mystery.

Hine, Al. *Money Round the World.* New York, Harcourt, Brace & World, Inc., 1963.
All about trading and money, from stones to metal coins and paper money.

Jacobs, Leland B. *Delight In Number.* New York, Holt, Rinehart and Winston, Inc., 1964.
These gay poems about groups of objects use many number words.

Kettlekamp, Larry. *Spirals.* Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1964.
An enjoyable look at spirals—some are in nature, some man-made, and they go in and out, up and down.

Lauber, Patricia. *The Story of Numbers.* New York, Random House, 1961.
The chart naming very large numbers should be a big help. Many uses of our number system are presented.

Massoglia, Elinor. *Fun-Time Paper Folding.* Chicago, Children's Press, 1959.
You would be surprised how many different things you can make by folding a single piece of paper. This book gives directions, and there is no cutting or pasting.

Ravielli, Anthony. *The World Is Round.* New York, Viking, 1963.
This picture story tells how man finally learned that the earth was round, even though it looks flat as a pancake.

Simon, Leonard. *The Day the Numbers Disappeared.* New York, Whittlesey House, 1963.
The author compares Egyptian, Greek, and Roman methods for writing numbers. You'll see why 25 = ∩∩||||| = κϵ = XXV.

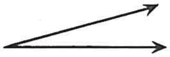
Thompson, George S. *Sparrow Socks.* New York, Harper & Row, Publishers, 1965.
A story to make you laugh: all about hundreds of pairs of striped socks—for sparrows.

GLOSSARY

addend Any one of a set of numbers to be added. In the equation $4 + 5 = 9$, the numbers 4 and 5 are addends.

addition An operation that combines a first number and a second number to give exactly one number. The two numbers are called addends, and the one number which is the result of combining the two numbers is called the sum of the addends.

angle Two rays from a single point.



approximation One number is an approximation of another number if the first number is suitably "close" (according to context) to the other number.

area The area of a closed figure or region is the measure of that region as compared to a given selected region called the unit, usually a square region in the case of area.

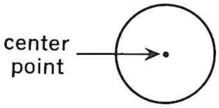
borrow A commonly used term for the regrouping process involved in certain types of subtraction.

Example: $$\begin{array}{r} {}^{3}\cancel{4}{}^{1}3 \\ -1\;7 \\ \hline 2\;6 \end{array} \rightarrow \begin{array}{r} 30 + 13 \\ -(10 + 7) \\ \hline 20 + 6 \end{array} = 26$$

carry A commonly used term for the regrouping that is involved in addition.

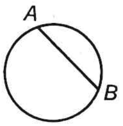
Example: $$\begin{array}{r} 57 \\ +26 \\ \hline 83 \end{array} \rightarrow \begin{array}{r} 50 + 7 \\ 20 + 6 \\ \hline 70 + 13 \end{array} = 83$$

center point A given point in the interior of a circle, such that all the points on the circle are the same distance from this given point.



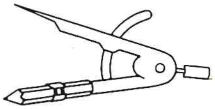
centimeter A unit of length. One centimeter is $\frac{1}{100}$ meter.

chord A line segment that has its end points on a given circle.



circle A set of points, all of which are a specified distance from a given point called the center or center point.

compass A device for drawing models of a circle.



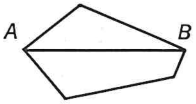
coordinate Number pair used in graphing.

coordinate axes Two number lines intersecting at right angles at 0.

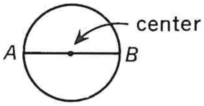
count To name numbers in regular succession.

cube A rectangular prism (box) such that all faces are squares.

diagonal A segment joining two nonadjacent vertices of a polygon. In the figure, the diagonal is segment *AB*.



diameter A chord that passes through the center point of the circle.



difference The number resulting from the subtraction operation.

digits The basic Hindu-Arabic symbols used to write numerals. In the base ten system, these are the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

division An operation related to multiplication as illustrated:

$$3 \times 4 = 12 \begin{array}{l} \nearrow 12 \div 3 = 4 \\ \searrow 12 \div 4 = 3 \end{array}$$

divisor In the problem $33 \div 7$, 7 is called the divisor.

Example: $$\begin{array}{rr} & 4 \\ \nearrow & 7\overline{)33} \\ & \underline{28} \\ \text{divisor} & 5 \end{array}$$

empty set A set that has no objects in it.

equality (equals; or =) A mathematical relation of being exactly the same.

equation A mathematical sentence involving the use of the equality symbol. Examples: $5 + 4 = 9$; $7 + \square = 8$; $\mathbf{n} + 3 = 7$.

equivalent fractions Two fractions are equivalent when it can be shown that they each can be used to represent the same amount of a given object. Also, two fractions are equivalent if these two products are the same:

$$\begin{array}{ccl} \frac{3}{4} & \times & \frac{6}{8} \end{array} \quad \begin{array}{l} 6 \longrightarrow 4 \times 6 \longrightarrow 24 \\ 8 \longrightarrow 3 \times 8 \longrightarrow 24 \end{array}$$

equivalent sets Two sets that may be placed in a one-to-one correspondence.

estimate To find an approximation for a given number. (Sometimes a sum, a product, etc.)

even numbers The whole-number multiples of 2 (0, 2, 4, 6, 8, 10, 12, · · ·).

factor *See* multiplication. The equation $6 \times 7 = 42$ illustrates that both 6 and 7 are factors of 42.

fraction A number pair or the symbol for a number pair, usually written $\frac{2}{3}$, $\frac{3}{4}$, $\frac{1}{2}$, and so on.

graph (1) A set of points associated with a given set of numbers or set of number pairs. (2) A picture used to illustrate a given collection of data. The data might be pictured in the form of a bar graph, a circle graph, a line graph, or a pictograph. (3) To draw the graph of.

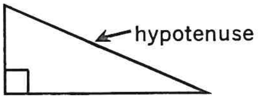
greater than ($>$) One of the two basic inequality relations. Examples: $8 > 5$, $28 > 25$, $80 > 50$.

grouping principle (associative principle) When adding (or multiplying) three numbers, you can change the grouping and the sum (or product) is the same.

Example: $2 + (8 + 6) = (2 + 8) + 6$

hexagon A six-sided polygon.

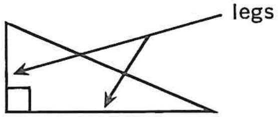
hypotenuse The side opposite the right angle in a right triangle.



inch A unit of length. One inch is $\frac{1}{12}$ foot.

inequality ($<$, $\neq$, $>$) In arithmetic, a relation indicating that the two numbers are not the same.

legs of a right triangle The two sides of a right triangle other than the hypotenuse.

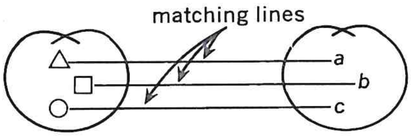


length (1) A number indicating the measure of one line segment with respect to another line segment, called the unit. (2) Sometimes used to denote one dimension (usually the greater) of a rectangle.

less than ($<$) One of the two basic inequality relations. Examples: $5 < 8$, $25 < 28$, $50 < 80$.

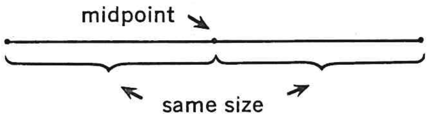
line segment See segment.

matching lines Lines used to indicate the correspondence between the objects in two sets.



measure (1) A number indicating the relation between a given object and a suitable unit. (2) The process of finding the number described in (1).

midpoint A point that divides a line segment into two parts of the same size.



minus (—) Used to indicate the subtraction operation, as in $7 - 3 = 4$ (read, "7 minus 3 equals 4").

multiple A first number is a multiple of a second number if there is a whole number that multiplies by the second number to give the first number. Example: 24 is a multiple of 6 since $4 \times 6 = 24$.

multiplication An operation that combines a first number and a second number to give exactly one number. The two numbers are called factors, and the one number which is a result of combining the two numbers is called the product of the two numbers.

multiplication-addition principle (distributive principle) This principle is sometimes described in terms of "breaking apart" a number before multiplying.

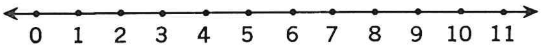
Example: $6 \times (20 + 4) = (6 \times 20) + (6 \times 4)$

negative number If a number adds to a whole number to give 0, it is a negative number.

For example: $5 + {}^{-}\mathbf{5} = 0$

$19 + {}^{-}\mathbf{19} = 0$

number line A line on which specified points are given number labels or names. The following example illustrates the whole-number line.



number pair Any pair of numbers. In this book, usually a pair of whole numbers.

numeral A symbol for a number.

odd number Any whole number that is not even.

one-to-one correspondence A one-to-one correspondence exists between two sets when the elements of one can be matched with the elements of the other in such a way that each element of the first set is matched with exactly one element of the second set and each element of the second set is matched with exactly one element of the first set.

order principle (commutative principle) When adding (or multiplying) two numbers, the order of the addends (or factors) does not affect the sum (or product). Example: $4 + 5 = 5 + 4$

parallel lines Two lines which lie in the same plane and do not intersect.

parallelogram A quadrilateral with its opposite sides parallel.

parentheses ( ) Symbols used to indicate grouping or order of performing operations. Examples:

$$(5 \times 4) - 2 = 18 \qquad 5 \times (4 - 2) = 10$$

pentagon A five-sided polygon.

place value A system used for writing numerals for numbers, using only a definite number of symbols or digits. In the numeral 3257 the 5 stands for 50; in the numeral 36,289 the 6 stands for 6000.

plus (+) Used to indicate the addition operation, as in $4 + 3 = 7$ (read, "4 plus 3 equals 7").

polygon A closed geometric figure made up of line segments.

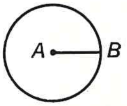
prime number A number greater than 1 whose only factors are itself and 1.

product The result of the multiplication operation. In $6 \times 7 = 42$, 42 is the product of 6 and 7.

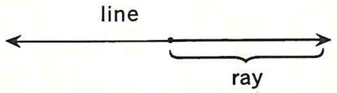
quadrilateral A four-sided polygon.

quotient The number (other than the remainder) that is the result of the division operation. It may be thought of as a factor in a multiplication equation.

radius (1) Any segment from the center point to a point on the circle. (2) The distance from the center point to any point on the circle.



ray The heavy part of the line shows a ray.



rectangle A quadrilateral that has four right angles.

regrouping A method of handling place value symbols in adding or subtracting numbers.

remainder

Example:

$$\begin{array}{r} 6 \\ 7\overline{)47} \\ \underline{42} \\ 5 \end{array} \longleftarrow \text{remainder}$$

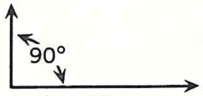
repeated addition Finding the sum of a set of numbers, each of which is the same.

Example: $5 + 5 + 5 + 5$

repeated subtraction Starting with a number and repeatedly subtracting the same given number from each difference that is obtained.

rhombus A parallelogram with 4 sides of the same size.

right angle An angle that has the measure of 90 degrees.



A right angle

right triangle A triangle that has one right angle.

Roman numerals Numerals used by the Romans. Used primarily to record numbers rather than for computing. Examples: IV, IX, XIV.

segment Two points on a line and all the points on that line that are between the two points.

sequence A collection or set of numbers given in a specific order. Such numbers are commonly given according to some rule or pattern.

set A group or collection of objects.

skip count To count by multiples of a given number. Example: Counting by fives — 0, 5, 10, 15, 20, · · · .

solution The number or numbers which result from solving an equation or a given problem.

solve To find the number or numbers which, when substituted for the variable or placeholder, make the given equation true.

square A quadrilateral that has four right angles and four sides that are the same length.

subtraction An operation related to addition as illustrated:

$$\begin{tikzcd}[row sep=small] & 15 - 8 = 7 \\ 7 + 8 = 15 \arrow[ur] \arrow[dr] & \\ & 15 - 7 = 8 \end{tikzcd}$$

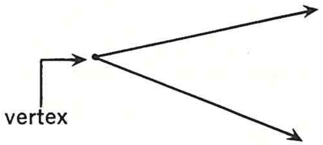
sum A result obtained by adding any set of numbers is referred to as the sum of the numbers.

times (×) Used to indicate the multiplication operation, as in $3 \times 4 = 12$ (read, "3 times 4 equals 12").

triangle A three-sided polygon.

unit An amount or quantity adopted as a standard of measurement.

vertex The point that the two rays of an angle have in common.



volume The measure, obtained using an appropriate unit (usually a cube), of the interior region of a space figure.

whole number Any number in the set

$$\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, \cdots\}.$$

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